FINAL

ORGANIZATIONAL REVIEW

of the Tucson Water Department

B&V PROJECT NO.173713

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PREPARED FOR

Tucson Water Department, AZ

31 MAY 2012

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Executive Summary

The City of Tucson ("City") retained Black & Veatch Corporation ("Black & Veatch") to perform an Organizational Review Study (Study) of the Tucson Water Department ("TW" or "Department") to determine whether the organizational structure and staffing levels are appropriate and to recommend modifications to maximize operational efficiencies. Of special concern to the Department is the End of Service ("EOS") impact on the organization: by the end of 2011, more than 70 employees will retire from the organization. Compounded with more than 50 vacant positions, the Department is facing a crisis situation in certain areas of the organization as people in whole sections retire or positions remain vacant.

Black & Veatch's scope of work for the Organizational Review Study commissioned by the City includes the following elements, which are to be completed within 60 days of receipt of a Notice to Proceed.

1. Create a brief overview of TW's existing organizational structure that examines what the Department is currently performing and how the Department is currently aligned.
2. Conduct a review of utility benchmarks and performance indicators and a comparison of TW's structure and functions against "best in class" standards.
3. Conduct a thorough review of the Business Services Division.
4. Conduct a review of the areas that "touch" the public, the External Relations of the Department, including the Customer Services Division, Dispatch/Communications, New Area Development, and Backflow.

The compressed schedule associated with this Study necessitated a high-level review of many areas of the Department and Black & Veatch has noted as appropriate areas that may require further study.

In conducting our analysis, Black & Veatch interviewed over 75 Department employees; conducted over 10 section briefings, and visited representative facilities where staff report to work. We also reviewed and analyzed more than 200 pieces of data related to the Department's activities. All of these activities occurred over a 3-week period. Follow-up interviews were conducted with select staff to gain clarification or additional information on an as needed basis. Conference calls with the Steering Committee and staff were also used to share information on the progress of the study, answer questions regarding the Study, and obtain information on external stakeholder concerns.

During the course of our work, Black & Veatch observed the following key items.

Areas of Excellence

1. **Staff and Management**: The Department is fortunate to have competent staff, knowledgeable and dedicated management.
2. **Best in Class Performance**: The Department exhibits "best in class" performance in the area of overall organizational structure; organizational best management

practices for long-range financial planning, customer involvements; continuous improvement; and drinking water compliance.

3. **Water Resource Management**: Water resources are well managed and will provide a sustainable supply into the future.
4. **Use of Technology:** The Department uses technology and is willing to invest in it to help improve work processes.
5. **Commitment to Training.** The Department is committed to providing training to its employees and strongly encourages it. There is a firm re-commitment to this initiative exhibited by senior management and a stated desire to increase resources in this area.

Principal Areas of Potential Improvement

1. **Customer Service**: Customer service levels at the Call Center have dropped to undesirable levels. Customer complaints are up and hold times are exceeding several minutes. In Black & Veatch's opinion, rectifying the situation at the Call Center is the number one priority for the Department. Some of our recommendations to help with this issue include:
    - Fill customer service representative ("CSR") vacancies as soon as possible.
    - Hire temporary staff (or authorize overtime) to get calls answered and the backlog of back office work cleared.
    - Temporarily suspend or reduce the number of performance metrics to help reduce stress levels and improve morale.
    - Increase training and coaching of staff.
2. **Utility Technician Program**: In the vein of continuous improvement, the Department acknowledges that management needs to continue evaluation of the Utility Technician ("UT") program. As part of this evaluation, the Department should **consider** some of these options:
    - Coursework for field-based skills already include a practicum as well as a minimum number of hours in the field before the skill level is "passed." Additionally, a required number of maintenance and operational hours at each skill block level should be satisfied prior to "passing."
    - The intent of the UT Program is to have cross-trained skilled employees. Maintenance of these skills is critical to the on-going sustainability of the program and so, rotating employees through different crews/service areas will help to keep learned skills sharp.
    - Parallel increased pay for skills with increased responsibility and accountability for performance to the new job level standards; this pay for

skills should be reinstated as soon as possible, even though the City may not reinstate merit increases immediately.

3. **Strategic Planning**: The Department needs to periodically engage in strategic planning activities to make sure to validate its vision and align its tactical plans with execution of the strategy.

   Black & Veatch suggests that the Department provide routine updates on progress made against the 2007 Business Plan activities and further, commit to engaging in strategic planning activities on a bi-annual basis. Moreover, Black & Veatch suggests that the Department adopt an implementation plan and schedule to help guide its strategic activities. Some specific recommendations that the Department should include as part of its process include the following key elements:

   - Begin the strategic review with a formal evaluation of the plan's status to-date.
   - Identify and revise, as necessary, the list of critical success factors and strategic initiatives. Strategic initiatives should support critical success factors.
   - Assign a champion for each critical success factor. It is the responsibility of each champion to assemble a team to help implement the assigned critical success factor.
   - Tie the Strategic Plan to the long-range financial plan for the Department.
   - Develop and report on performance measures that address the ten attributes of an effectively managed utility as outlined in the Effective Utility Management (EUM):
     - Product quality;
     - Customer satisfaction;
     - Employee and leadership development;
     - Operational optimization;
     - Financial viability;
     - Infrastructure viability;
     - Operational resilience (i.e., risk management, safety, emergency preparedness);
     - Community sustainability;
     - Water resource adequacy; and
     - Stakeholder understanding and support.
   - Report on a quarterly basis the status of each program within a strategic initiative.

  - Define a clear planning schedule with deadlines.
  - Communicate the final strategic plan to all stakeholders.

4. **Succession Planning**: The EOS Program has highlighted the lack of succession planning in the Department, which was also precluded by hiring freezes throughout the Department and the City. Black & Veatch recommends that as part of the annual employee performance review, all personnel with supervisory duties should identify people with the potential to fill their position. In addition, the Department should develop a management / leadership program to help train personnel in such areas as project management, communication, leading and mentoring, etc. The Department's succession plan should be reviewed annually. The Department's succession plan should follow all Civil Service rules and internal policies.

5. **Review Span of Control**: Similar to the situation for Succession Planning, the EOS Program has also provided the impetus for a review of the Department's span of control. Addressing span of control issues will also provide the Department an opportunity to evaluate possible job reclassifications and / or develop new job descriptions that more accurately reflect actual job duties.

6. **Department Leadership**: Recruit a new permanent Director with water industry experience with a utility of similar size and complexity.

Recommendations

The following table categorizes the recommendations provided in this Report based on Black & Veatch's assessment of implementation: Short-term (one year or less) or Mid- to Long-Term. The purpose of the table is to help the Department determine what recommendations, if implemented, provide short-term gains, while identifying those activities that require further study and possible investment to provide longer term efficiencies.

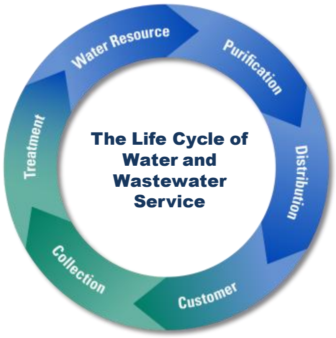
Black & Veatch notes that the following are just recommendations and in some cases, the Department will need to conduct additional analyses to determine the feasibility of implementation.

	RECOMMENDATION	EUM ATTRIBUTE	TIME FRAME
1	Call Center / Customer Service: • Fill vacant CSR positions • Hire temporary staff if needed to answer phones • Shift people from other customer service areas to answer calls • Reduce or suspend performance metrics to build employee morale by reducing stress levels	Customer Satisfaction; Stakeholder Understanding and Support	Short
2	Call Center / Customer Service: • Refine current business processes to fine-tune	Customer Satisfaction; Employee and	Mid

	back-office operations • Increase staff to handle Internet business • Increase CSR training • Increase CSR workspace	Leadership Development; Operational Optimization	
3	Call Center / Customer Service: • Upgrade IVR • Conduct customer satisfaction survey	Customer Satisfaction; Operational Optimization	Long
4	Organizational Structure: • Move Intergovernmental Agency (“IGA”), Public Information Office (“PIO”), Conservation, and Mayor & Council sections to new Management Services Division (Short Time Frame) • Fill Finance Manager vacancy • Eliminate O&M and Capital Budget Management Coordinator position • Add Billing / IT to Finance • Add 24/7 Dispatch Center to Customer Service • Add 2 superintendents under Distribution & System Maintenance • Move planners and schedulers to Distribution & System Maintenance • Add UT Program Trainer • Consolidate Water Resources under Planning (Short Time Frame) • Develop cross-training program for water resource field group to work more closely with operations staff • Move Backflow Prevention to Operations (Short Time Frame) • Share Administrative staff where feasible	Operational Optimization; Operational Resiliency; Financial Viability; Infrastructure Stability; Employee and Leadership Development; Product Quality; Water Resources	Mid to Long
5	Maintenance Division • Outsource property maintenance activities and redeploy staff to other maintenance work • Add staff and training to meet 70% planned maintenance metric • Re-commit to the Department’s Program Driven Maintenance initiative • Evaluate modifications to the UT Program	Operational Optimization; Operational Resiliency; Financial Viability; Infrastructure Stability; Employee and Leadership Development;	Mid to Long

	• Consider feasibility of using Locators as first responders on call outs • Start documenting contractor billings for damages • Continue focused training on technology • Update computers and cell phones for field personnel	Product Quality	
6	Operations Division – Water Quality • Move Reclaimed Water operations to Water Treatment Plant Operations • Fill the Disinfection and Reclaimed Water supervisor positions • Assign superintendent to oversee TARP project • Automate compliance monitoring • Improve Work Order closeout procedures between Maintenance and Operations personnel	Operational Optimization; Operational Resiliency; Financial Viability; Infrastructure Stability; Employee and Leadership Development; Product Quality	Mid to Long
7	Other Areas • Evaluate specific elements of Five Star Safety Program for applicability to Department • Implement succession planning program throughout the Department	Operational Optimization; Operational Resiliency; Employee and Leadership Development;	Short

1. Introduction



The City of Tucson ("City") retained Black & Veatch Corporation ("Black & Veatch") to perform an Organizational Review Study (Study) of the Tucson Water Department ("TW" or "Department") to determine whether the organizational structure and staffing levels are appropriate and to recommend modifications to maximize operational efficiencies. Black & Veatch's approach to conducting the organizational review is to consider the full life cycle of the resource. This is especially true in a water challenged environment such as Tucson. Changes in one part of the cycle may affect the level of service provided in another part. The objective is to improve service to the Department's customer with improved levels of service in all elements of the life cycle in the most economical manner.

The Department provides water services to almost 703,000 people covering a service area of more than 350 square miles. Comprised of more than 220 active production wells, 4,500 miles of delivery pipelines, 114 booster stations, and 55 storage facilities, TW delivered more than 107,000 acre-feet ("AF") of potable water to its customers in 2010. In 2010, TW reported a 0.024 percent meter reading error rate and performed over 2,824,000 meters reads. Moreover, the Department repaired 2,254 emergency water outages and restored over 93 percent of these outages within four to eight hours.

Approximately 40 percent of the population served by the Department is outside of the City of Tucson's limits and within the unincorporated areas of Pima County. TW's expansive service area is one of the largest among utilities serving populations greater than 100,000 and this, in and of itself, presents unique challenges. In comparison, the City of Detroit provides retail service to almost 900,000 people over a 144 square mile service area – a far higher population density compared to TW. Table 1.0-1 summarizes a limited review of other utilities serving populations between 700,000 and 900,000. As seen from the table, these large utilities have population service densities ranging from about 1,400 persons/square mile to over 17,000 persons/square mile. The Department's estimated population density is 2,200 persons/square mile.

Table 1.0-1 Comparison of Population Served and Service Area Size

Water Utility	Location	Population Served	Service Area Size (sq. miles)
Oklahoma City Water Utilities Trust	Oklahoma, OK	598,000	420
Tucson Water Department	Tucson, AZ	703,000	350
Charlotte-Mecklenburg Utiltiies	Charlotte, NC	776,000	300
Austin Water Utility	Austin, TX	800,000	450
Greater Cincinnati Water Works	Cincinnati, OH	810,000	400
San Francisco Public Utilities Commission (Retail Only)	San Francisco, CA	856,100	50
City of Detroit Water & Sewerage Department (Retail Only)	Detroit, MI	899,400	144
Fort Worth Water Department	Fort Worth, TX	930,000	300
Las Vegas Valley Water District	Las Vegas, NV	1,181,300	125
City of Phoenix Water Services Department	Phoenix, AZ	1,200,000	475
San Antonio Water Systems	San Antonio, TX	1,219,100	412
San Diego Water Department	San Diego, CA	1,281,400	210
Dallas Water Utilities	Dallas, TX	1,300,000	699
East Bay Municipal Utility District	Oakland, CA	1,300,000	331
City of Houston Public Works	Houston, TX	2,700,000	600

The Department currently employs 553 people in its water enterprise fund with approximately 50 vacancies. In 2008, the Department encountered a loss in revenue, due in part to lowered consumption demands and the economic decline. To address the revenue shortfall, the Department made operational cuts and reduced staffing levels through attrition. The City also introduced the End of Service ("EOS") Program, which helped provide an opportunity to decrease staff levels. This one-time offering allows qualified employees to separate from City service with guaranteed benefit levels. Under the City's EOS Program, the Department lost another 70 staff members on or before December 31, 2011. Finally, similar to many agencies across the nation, the City implemented furlough days and the Department followed suit. The City's budget include nine furlough days for Department Staff in fiscal year (FY) 2011/12. (Note: due to fiscal savings, furloughs for Tucson Water were eliminated at the end of the first quarter of FY 2011/12).

1.1. SCOPE AND PURPOSE

The purpose of this report (Report) is to present the findings and recommendations from Black & Veatch's study of the City of Tucson's Water Department. In many areas of the organization, the Department is losing people in key positions due to the EOS program. As such, the City asked Black & Veatch to examine the Department's organizational structure and make recommendations on how to re-organize the utility to minimize the impact on operations. Additionally, a special focus of the Report is on the Business Services Division because of the high percentage of personnel retirements. Black & Veatch also paid particular attention to the Customer Call group due to the high level of customer complaints regarding service levels (phone wait times).

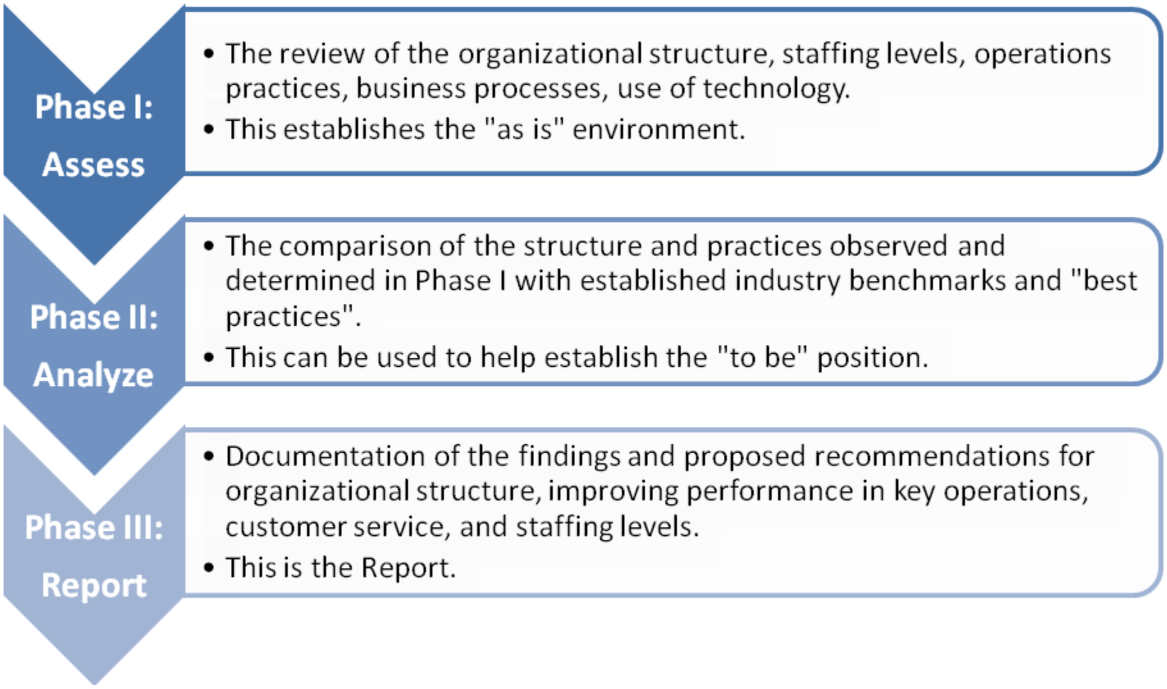
Black & Veatch's scope of work for the Organizational Review Study commissioned by the City includes the following elements:

1. Create a brief overview of TW’s existing organizational structure that examines what how the Department is currently performing and how the Department is currently aligned.
2. Conduct a review of utility benchmarks and performance indicators and a comparison of TW’s structure and functions against “best in class” standards.
3. Conduct a thorough review of the Business Services Division.
4. Conduct a review of the areas that “touch” the public, the External Relations of the Department, including the Customer Services Division, Dispatch/Communications, New Area Development, and Backflow.

The compressed schedule associated with this Study necessitated a high-level review of many areas of the Department and Black & Veatch has noted as appropriate areas that may require further study.

1.2. METHODOLOGY

The methodology used in the performance of this Study consists of three phases.



Phase I: Assess

- The review of the organizational structure, staffing levels, operations practices, business processes, use of technology.
- This establishes the "as is" environment.

Phase II: Analyze

- The comparison of the structure and practices observed and determined in Phase I with established industry benchmarks and "best practices".
- This can be used to help establish the "to be" position.

Phase III: Report

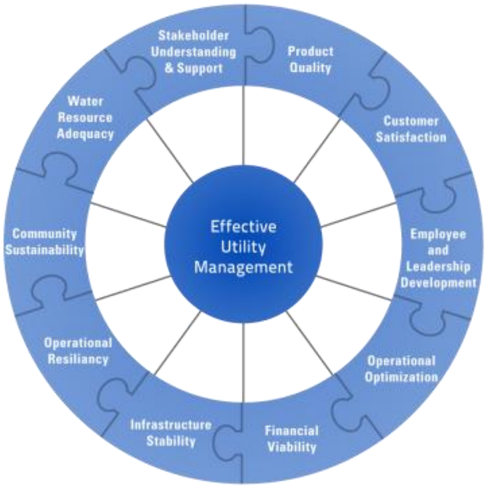
- Documentation of the findings and proposed recommendations for organizational structure, improving performance in key operations, customer service, and staffing levels.
- This is the Report.

1.3. TOOLS AND TECHNIQUES

Our Methodology utilizes a number of tools and techniques that we have found to be effective when doing similar assessments of other water and wastewater utilities. Examples include the following:

1.3.1. Effective Utility Management (EUM)

In response to financial and organizational challenges facing the water industry, a consortium of water industry technical and organizational associations joined forces to sponsor and publish a primer to promote effective utility management. The associations worked with a Utility Advisory Group consisting of 16 representatives from the public and private water sector. The results of their efforts - *Effective Utility Management - A Primer for Water and Wastewater Utilities*, was published in June of 2008. The purpose of the Primer is to provide water and wastewater utility managers with a framework and guidelines to develop processes for making practical, systematic changes to achieve excellence in utility performance.


Stakeholder Understanding & Support
Product Quality
Customer Satisfaction
Employee and Leadership Development
Operational Optimization
Financial Viability
Infrastructure Stability
Operational Resiliency
Community Sustainability
Water Resource Adequacy
Effective Utility Management

The Primer recognizes that good utility operation addresses more than financial and organizational goals. Ten attributes have been identified that provide reference points to help utilities maintain a balanced focus on all important operational elements of a utility. The attributes include:

1. Product Quality
2. Customer Satisfaction
3. Employee and Leadership Development
4. Operational Optimization
5. Financial Viability
6. Infrastructure Stability
7. Operational Resiliency
8. Community Sustainability
9. Water Resource Adequacy
10. Stakeholder Understanding and Support

Review of the attributes recognizes the challenges an effective utility faces when balancing the demands and needs of

a) internal and external stakeholders
b) operational and financial business units
c) growth and sustainability
d) line employees and management

The methodology used in this Study recognizes the attributes and has incorporated them into our assessment of the Department.

1.3.2. Interviews with Managers and Employees

To gain insights into the operating conditions, current policies and procedures, available equipment, use of technology, existing organizational strengths, opportunities for improvement and other considerations, the Black & Veatch team interviewed over 75 Department employees; conducted over 10 section briefings, and visited representative facilities where staff report to work. We also reviewed and analyzed more than 200 pieces of data related to the Department's activities. All of these activities occurred over a 3-week period. Follow-up interviews were conducted with select staff to gain clarification or additional information on an as needed basis. Conference calls with the Steering Committee and staff were also used to share information on the progress of the study, answer questions regarding the Study, and obtain information on external stakeholder concerns.

Black & Veatch notes that all employees encountered were professional, courteous, and forthright. The overall sentiment of these employees and their outlook for improving the utility was very optimistic.

1.3.3. Benchmarking as a Tool to Support the Analysis

As part of the Study, Black & Veatch used industry benchmarking information where available to establish a baseline for comparing the overall organization, staffing and operation of the Department with the experience of other similar utilities. For some areas, benchmarking data were limited and so informal phone surveys of comparably sized utilities were used to provide information. While benchmarking is useful to help a utility establish goals (do you want to be "best in class" or just in the middle?), Black & Veatch recognizes it is simply a tool, and not the "answer" to how a utility should be organized or run.

Black & Veatch believes that it is also important to note that other factors, such as the geographic area served by a utility, water quality, energy costs and other factors can further skew benchmarking comparisons.

1.4. DISCLAIMER

In conducting our study, we reviewed the books, records, agreements, capital improvement programs, and customer sales and financial projections of the Department as we deemed necessary to express our opinion of the operational cost projections. While we consider such books, records, documents, and projections to be reliable, Black & Veatch has not verified the accuracy of these documents.

The projections set forth in this report below are intended as "forward-looking statements". In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors may include the Department's ability to execute the capital improvement program as scheduled and within budget, regional climate and weather conditions affecting the demand for water, and adverse legislative, regulatory or legal decisions (including environmental laws and regulations) affecting the Department's ability to manage the system and meet water quality and / or wastewater discharge requirements.

2. Organizational Structure

As part of this Report, the City tasked Black & Veatch with examining the Department's current organizational structure. The purpose of the review is to assess the effectiveness of the structure in meeting the Department's goals. Recognition is given to the impact historical changes have had on the current organization. The commitment to excellence of the employees of Tucson Water is evidenced by achieving a Platinum Award for Sustained Competitiveness Achievement from the Association of Metropolitan Water Agencies. The following sections discuss Black & Veatch's observations concerning the Department's current organization.

2.1. PRINCIPLES OF ORGANIZATIONAL STRUCTURE

In the United States, utilities typically organize their departments following one of two predominant approaches: a functional organizational structure or a product / line-of-business organizational structure. This section also discusses a "hybrid" structure that some utilities also deploy.

2.1.1. The Functional Structure

A functional organizational structure generally follows the value chain of the utility. Employees are grouped together based on their common experience and responsibilities. In a manufacturing setting, this typically results in the design of groups like production, sales & marketing, finance, etc. In the case of water utilities, the value chain consists of production, distribution and customers. Within a utility setting, the design of groups like engineering, treatment, customer management, and finance are examples of functional design.

Benefits associated with functional organizational structures include synergies gained through sharing of common experiences and approaches. This type of structure fosters an environment of specialization and expertise development. As an example, engineers can adopt key learnings from each other regarding how to approach a common issue, which can lead to productivity advantages. Management efficiency is also usually a result of the functional structure. Because organizations are designed around specialties, a greater degree of managerial control typically results, as these organizations are typically led by individuals with in-depth knowledge of that particular specialty. As an entity grows or expands, additional specialty areas are added, in effect growing the "horizontal span" of the organization. Finally, a functional structure typically does not encounter redundancy in functions across groups as can be found in other structures.

Functional organizational structures are not without challenges. As entities grow and expand, and a greater diversity of activities (or specialties) is required to meet goals, organizations arranged functionally can actually suffer a loss of strategic control. Difficulty in coordinating activities can result as communication efforts and strategic alignment becomes more complicated. The greater the horizontal span, the more likely elements of the organization will adapt their activities to best address the challenges in their specialty area, and the greater the risk of separation from the strategic vision of the entity. This can lead to a "silo" phenomenon where differences in priorities among groups cause issues in overall execution. Some elements of the organization may prioritize short-term objectives, while others may take a longer-term outlook. Communication styles can vary across organizations and create barriers. In short, functions can find it increasingly difficult to communicate and coordinate with each other, and execution can suffer.

As organizations increase in complexity, measuring performance can also become more difficult in a functionally oriented structure. It can be difficult to enforce accountability because determining which function is responsible for a particular issue can be difficult. Finally, management's efforts can become consumed with trying to solve coordination and communication problems, which can contribute to overall inefficiency and a dilution in the effectiveness of organizational strategy.

2.1.2. The Product Structure

The product or line-of-business organizational structure advocates organizing around product lines, therefore grouping organizations together based on the similarities or differences among products. For Tucson Water, the lines of business are Customer Service and Asset Management. Support functions, such as engineering, finance, procurement, or others, may be centralized. However, it is not uncommon for employees within the centralized divisions to specialize in one of the product areas, which minimizes communication problems throughout the product line.

Advantages of this structure include a general reduction in the communication and control problems that can emerge as business complexity overwhelms the functional organizational structure. The reduction in communication and control issues generally stems from increased focus on the needs of the product rather than the individual function, and leads to better coordination within the product. Performance measurement and cost attribution can be more easily accomplished under this structure as goals and objectives associated with specialized products are easier to track and manage. It is also typically easier to determine accountability. When compared to the functional organizational structure, this structure introduces an additional management level in that each product would need a dedicated leader assigned to manage product activities. This increased management can enable product line leaders to focus on day to day execution and give top line managers more time for strategic planning and broader initiatives. Finally, competition can result between lines of business that can be a healthy motivator and contribute to a positive work environment.

While the product or line-of-business organizational structure does address some of the concerns from the functional organizational structure, there are disadvantages as well. The cost of operation can be higher than the functional structure in terms of increased management, and the risk of redundancy in functions increases. This structure also can experience diminished development of expertise when compared to the functional structure. Finally, while competition between lines-of-business can be a healthy motivator, it needs to be managed such that lines of business do not ultimately increase the cost of business by competing for employees with specialized skills or even “robbing” employees from one line of business to another.

2.1.3. The Hybrid Structure

A hybrid approach is sometimes deployed which organizes by function at one level and by product at another. Because the hybrid approach combines elements of both the functional and the line-of-business structures, it is sometimes selected as a transition from a prior structure when a change is implemented. This approach may also be selected in an attempt to minimize the shortcomings of the functional or line-of-business approaches.

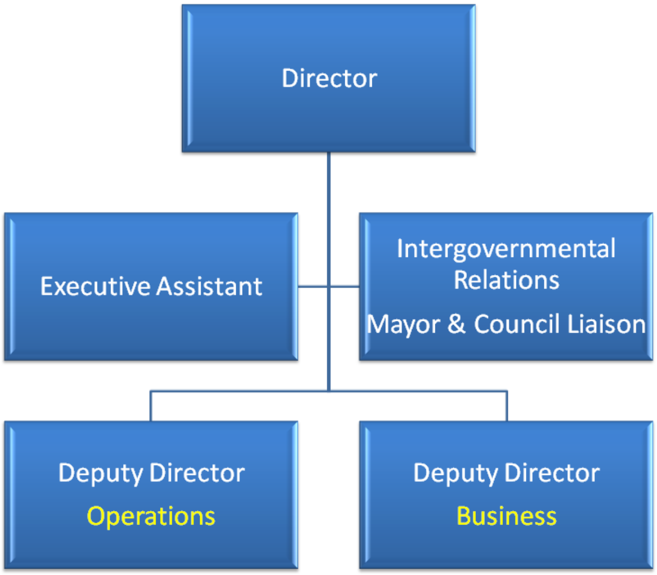
Under this approach, organizations that could benefit the most from specialization, such as engineering, procurement, and finance, remain centralized and functionally oriented. However, in areas that do not have much redundancy risk, or that require additional organizational visibility, or need additional accountability, product orientations can be made underneath the functional department.

Shortcomings of the hybrid approach can include coordination and communication, as is consistent with the functional approach. Additionally, roles and responsibilities can become unclear when priorities of the functional groups and the product groups are not in alignment. Finally, accountability can be difficult to manage, particularly as it relates to product management.

2.2. TUCSON WATER DEPARTMENT'S ORGANIZATIONAL STRUCTURE

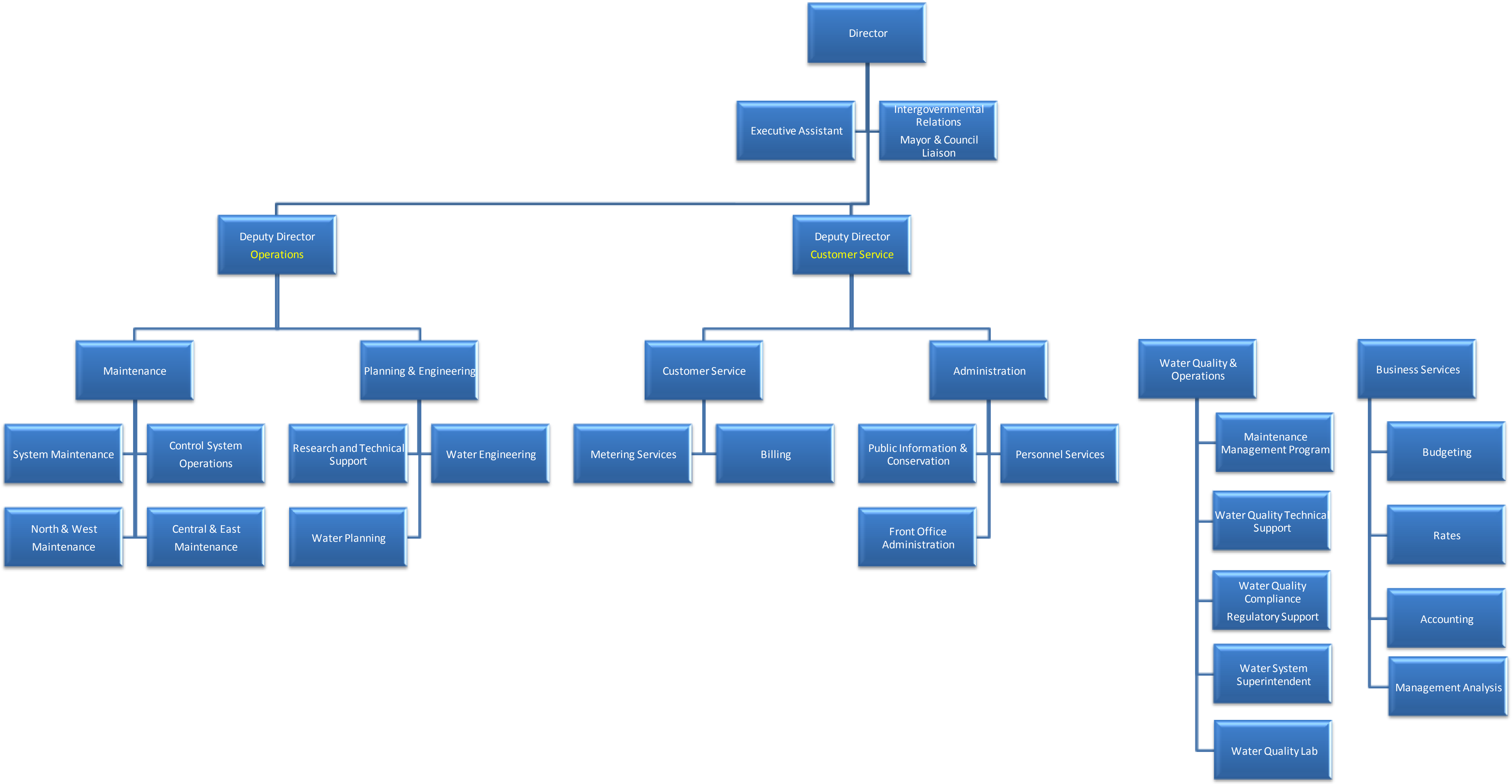
The Department's current organization reflects the characteristics of a Hybrid Structure. Over the last few years, the Department has undergone a few reorganizations to address staff attrition, retirements, and the operating philosophies of new (interim) Directors. As illustrated in Figure 2.2-1, two Deputy Directors generally focus on the "product lines' of operations and business. Reporting to the Deputies are Administrators, which focus on functional specialties. The functional specialization continues in many of the Supervisors who report to the Administrators.

Figure 2.2-1 General TW Organization



As seen in Figure 2.2-2, the current organizational structure is relatively horizontal with numerous sections. The sheer number of sections presents a challenge to both staff and management to make sure that projects / activities are coordinated; that lines of communication exist; and that "silos" do not develop.

Figure 2.2-2 Current Tucson Water Department Organization


Director
Executive Assistant
Intergovernmental Relations
Mayor & Council Liaison
Deputy Director
Operations
Deputy Director
Customer Service
Maintenance
Planning & Engineering
Customer Service
Administration
Water Quality & Operations
Business Services
System Maintenance
Control System Operations
North & West Maintenance
Central & East Maintenance
Research and Technical Support
Water Engineering
Water Planning
Metering Services
Billing
Public Information & Conservation
Personnel Services
Front Office Administration
Maintenance Management Program
Water Quality Technical Support
Water Quality Compliance
Regulatory Support
Water System Superintendent
Water Quality Lab
Budgeting
Rates
Accounting
Management Analysis

2.2.1 Span of Control and Layers of Management

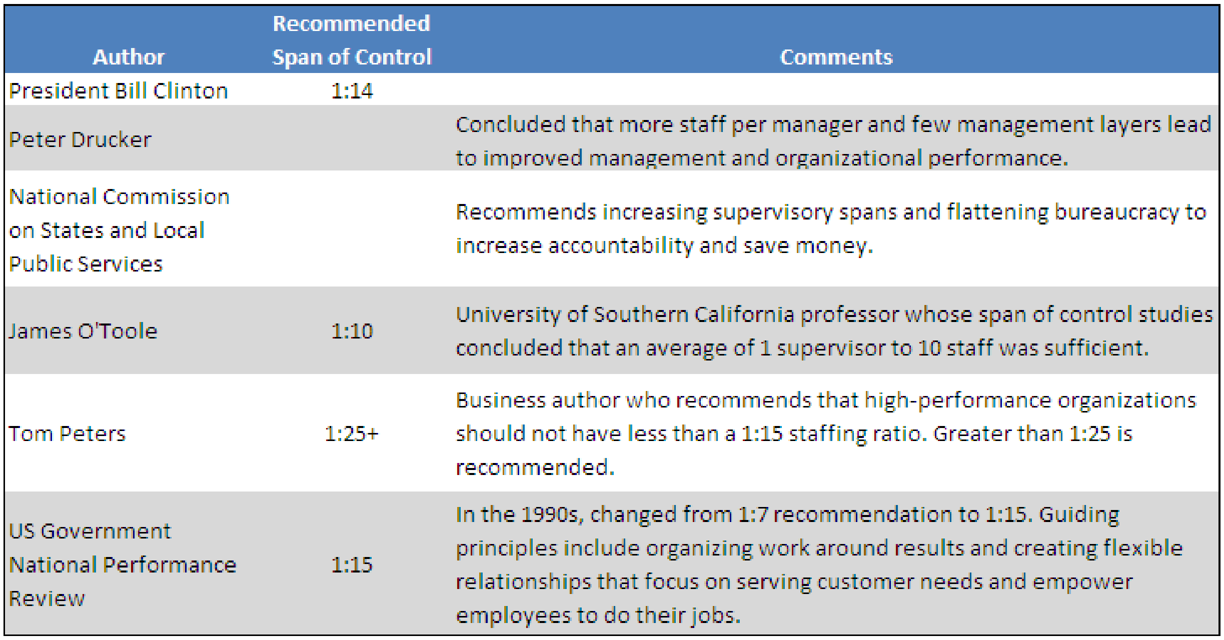
Span of control and management layers are components of organizational structure. It is important to study organizational structure and the span of control because they affect communication, decision making, flexibility, employee morale, and resource allocation. Challenges faced by the End of Service program provide an opportunity to review and evaluate the span and layers within Tucson Water.

Prior to the 1950s, classic span of control theory believed that supervisors needed to maintain close control over their direct reports. The current best management practice holds that organizations with small spans of control are inefficient and that flatter organizations with wider spans of control could lead to organizational efficiencies. The basis for this shift in practice in public sector organizations is recognition by industry experts of the following trends:

- Generational differences in the worker population – Today's workers are more independent and there is a greater focus on individual worker performance.
- Streamlining of management ranks – To help manage costs, organizations have reduced the number of managers and supervisors. As a result, the role of the supervisor has changed from "control" to "support".
- Cross-functional teams and decentralization – Highly specialized workforces are becoming outdated. Today's workers are encouraged to engage in cross training, which in turn reduces the number of direct supervisors needed.

Table 2.2.1.-1 summarizes the recommendations from management experts on desired spans of control.

Table 2.2.1-1 Recommended Spans of Control



Author	Recommended Span of Control	Comments
President Bill Clinton	1:14	
Peter Drucker		Concluded that more staff per manager and few management layers lead to improved management and organizational performance.
National Commission on States and Local Public Services		Recommends increasing supervisory spans and flattening bureaucracy to increase accountability and save money.
James O'Toole	1:10	University of Southern California professor whose span of control studies concluded that an average of 1 supervisor to 10 staff was sufficient.
Tom Peters	1:25+	Business author who recommends that high-performance organizations should not have less than a 1:15 staffing ratio. Greater than 1:25 is recommended.
US Government National Performance Review	1:15	In the 1990s, changed from 1:7 recommendation to 1:15. Guiding principles include organizing work around results and creating flexible relationships that focus on serving customer needs and empower employees to do their jobs.

Span of control is defined as the number of employees a supervisor oversees. For this Study, Black & Veatch considered all positions defined as management or supervisor – with or without direct reports – included in the Department's organizational charts as part of the analysis. We calculated the span of control ratios by counting the number of subordinates supervised by any one individual. The number of staff was based on budgeted full-time equivalents ("FTEs") and does not include any temporary employees, interns, volunteers, or staff shared with other departments.

About 17 percent of the Department's regular employees have some supervisory responsibilities, including some, but not all, of the Department's Management/Professional staff. Management study experts advocate increasing supervisory spans of control to enhance organizational efficiency and effectiveness. Using an FTE basis, Black & Veatch estimates that the Department-wide staff to supervisor ratio is about 4.75 to 1, though this ratio varies from division to division, as seen in Table 2.2.1-2. Also as noted below, supervisory positions are counted as such, based on job title and position description. For example, the table below notes that there are 9 supervisory positions in the Director's Office. This count is based on position description and title, in that people in this position have supervisory elements associated with their job description. However, it does not necessarily imply that people in these positions are actively engaged in supervisory activities. Additionally, people in the Director's Office, such as the Deputy Director of Assets, may have supervisory responsibilities outside of the Division.

Table 2.2.1-2 Tucson Water Span of Control

	Supervisory Positions [*]	Staff Positions	Total	Span of Control
Director's Office	9	15.5	24.5	1:1.72
Business Services	6	9	15	1:1.5
Customer Services	18	97	115	1:5.39
Maintenance	30	154	184	1:5.13
Planning & Engineering	18	121	139	1:6.72
Water Quality & Ops	13	57.5	70.5	1:4.42
Total	**99**	**470.5**	**569.5**	**1:4.75**

[*] Based on job title and position description.

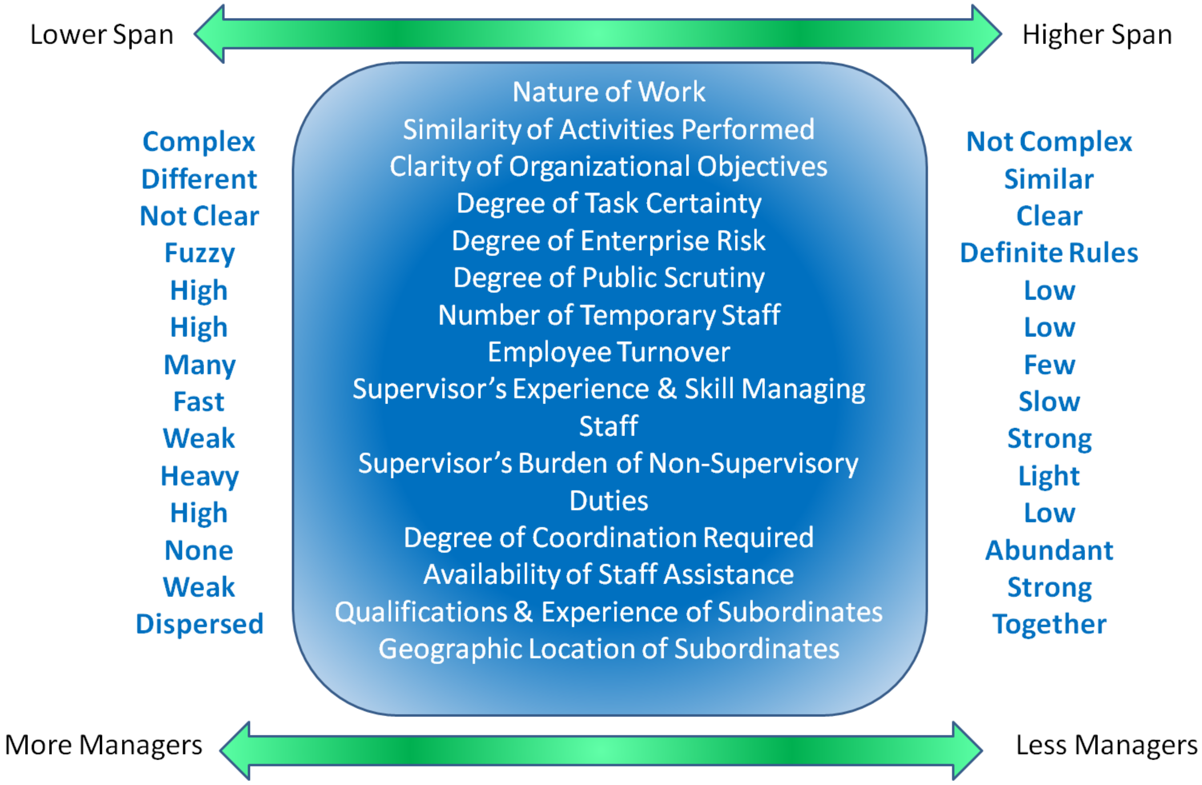
We note that the type of work performed by a division or section may affect what makes for an appropriate span of control. For example, sections that use more technology and have more systematic processes may benefit from broader spans of control. Further, due to the limited duration of this study, Black & Veatch did not quantify a breakdown of supervisory positions with a ratio of less than 5 direct reports. As a point of comparison, Table 2.2.1-3 demonstrates how the Department's span of control compares to some other water utilities. Black & Veatch notes that information for comparable water-only utilities serving populations greater than 500,00 is very limited.

Table 2.2.1-3 Comparison to Other Utilities

Utility	Average Span of Control	Comments
Palo Alto, CA	7:1	Combined water, wastewater, electric utility
Long Beach, CA	8.5:1	Combined water, wastewater, gas utility
Tucson, AZ	4.88:1	Water Utility
Portland, OR	6.75:1	Water Utility
Seattle, WA	5:1	Water Utility
Alameda County, CA	9:1	Water Utility
Philadelphia, PA	6.5:1	Combined water and wastewater utility

Although there is no ideal ratio of supervisors to staff (it varies from organization to organization), Black & Veatch suggests that the Department could set goals and targets for expanding the span of control. In light of the EOS impact on the Department, expanding the span of control may be a viable organizational alternative. Figure 2.2.1-1 illustrates the general advantages and disadvantages for expanding spans of control. Black & Veatch notes that advantages and disadvantages illustrated in Figure 2.2.1-1 are general in nature and not all observations noted may be applicable to the Department's situation.

Figure 2.2.1-1 Span of Control Advantages and Disadvantages



Complex	Nature of Work	Not Complex
Different	Similarity of Activities Performed	Similar
Not Clear	Clarity of Organizational Objectives	Clear
Fuzzy	Degree of Task Certainty	Definite Rules
High	Degree of Enterprise Risk	Low
High	Degree of Public Scrutiny	Low
Many	Number of Temporary Staff	Few
Fast	Employee Turnover	Slow
Weak	Supervisor's Experience & Skill Managing Staff	Strong
Heavy	Supervisor's Burden of Non-Supervisory Duties	Light
High	Degree of Coordination Required	Low
None	Availability of Staff Assistance	Abundant
Weak	Qualifications & Experience of Subordinates	Strong
Dispersed	Geographic Location of Subordinates	Together

Layers of management is defined as the highest number of layers the non-supervisory staff would have to report through to reach the top manager. Black & Veatch used this calculation to determine the longest leg separating frontline staff from the Director's office. Under the current organization, there are five layers of management. Based on an informal survey of other large utilities, the Department's figure of five is comparable to its peers.

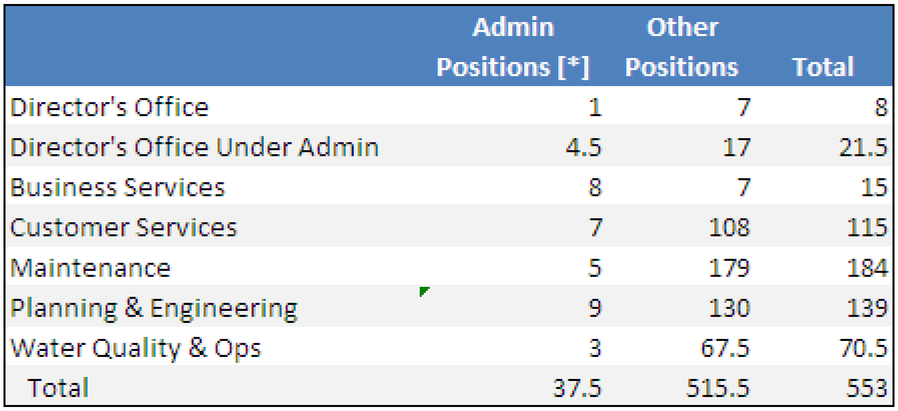
2.3. ADDITIONAL RECOMMENDATIONS ON THE CURRENT STRUCTURE

- ***Update Strategic Plan (EUM Attributes: Employee and Leadership Development; Stakeholder Understanding and Support)***. Since the spring of 2008, the Department has had four leaders. A by-product of frequent change in leadership is inconsistencies with the vision and mission of the utility. Black & Veatch recommends that the Department develop a strategic plan to address a number of future issues.

  Currently, staff has a limited view of the Department's strategic vision and direction. While the Director in part dictates this, Black & Veatch suggests that rather than wait for a new Director, Department Management should complete a strategic planning effort. The Department is one of the largest in the nation and serves as a model to many of its peers. To maintain this standing, the Department needs to periodically engage in strategic planning activities to make sure to validate its vision and align its tactical plans with execution of the strategy. Such an exercise would not only be a team building activity, but would help provide staff guidance. It also provides a framework from which the Department can make capital planning and operational decisions and develop strategies.

- ***Examine Span of Control (EUM Attributes: Employee and Leadership Development).*** The optimal direct report to supervisor ratio varies from industry to industry. However, it is generally recognized that positions such as Deputy Director will have a minimum of two to three direct reports. The Department should consider potentially reclassifying any staffing positions that have very few (or no) direct reports (too small a span of control) to make sure that these positions meet the City's job classification requirements. In some cases, the Department has chosen not to fill vacant positions due to its economic situation. These positions should be reviewed to see their impact on staff to supervisor ratios.

- ***Consolidate Resources (EUM Attributes: Operational Optimization)***. The number of secretaries and clerical staff compared to other positions in the Department needs review. In general, we agree that Division heads and above need the administrative support (secretaries or administrative assistants). The Department should consider using a secretarial / admin pool to provide support to other groups. While discussions with staff reveal a belief that more administrative help is needed, Black & Veatch believes that in some areas of the organization, shifting Project Management tasks to administrative staff limits project management training.



	Admin Positions [*]	Other Positions	Total
Director's Office	1	7	8
Director's Office Under Admin	4.5	17	21.5
Business Services	8	7	15
Customer Services	7	108	115
Maintenance	5	179	184
Planning & Engineering	9	130	139
Water Quality & Ops	3	67.5	70.5
Total	37.5	515.5	553

[*] Consists of secretaries, admin and staff, and clerks.

- ***Increase coordination between Staff Engineers and Water Resource staff with the Operating Divisions (Maintenance, Water Quality and Operations) (EUM Attributes: Employee and Leadership Development; Operational Optimization; Stakeholder Understanding and Support).*** Currently the Engineers are staffed within an Engineering Division that is independent of the Operating Division. Coordination between field personnel and the engineers / water resource staff needs to improve. Division engineers and water resource staff would participate in the day-to-day operational task and would be instrumental in development of Department Capital budget.

- ***Form a 24/7 Dispatch Center (EUM Attributes: Operational Optimization; Operational Resiliency; Customer Satisfaction).*** The current coverage of dispatch activities, particularly at night, works if there are no emergencies. Unfortunately, when one does occur, such as in February, the night-shift operator's first priority is to make sure that the system is functioning. Answering customer calls is a much lower priority. However, from a customer's perspective, lack of response is taken as poor customer service and reflects poorly on the Department and City. Thus, the cost of dedicating staff and reorganizing to form a Dispatch Center is small in comparison to the goodwill established with the community (calls are answered promptly and customers become a priority) and staff (they are no longer being tasked with doing duties that are not in their job descriptions or comfort level.)

2.4. SUGGESTED REORGANIZATION OF TUSCON WATER DEPARTMENT

In light of the decreased staff levels in numerous divisions and sections, Black & Veatch proposes the following changes to the Department's organizational structure. The changes reflect the organizational structure at the time of this report, including the reallocation of 7 vacant potions to CSR in early August of 2011. The suggested changes are meant to address interim operating conditions and we note that while some changes can be undertaken immediately, some will require coordination with the City's Human Resources Department, to address possible job reclassifications and/or reallocations.

The proposed organization refines the focus of the Department on Assets and Customers. This mirrors the value chain of the Department. Moreover, the proposed organizations charts on the following pages streamline vacant positions or upcoming EOS positions that are not needed, or reclassify those positions to areas where additional staff is needed.

The following is a summary of the suggested organizational changes along with estimated time frames for implementation:

- Director's Office
  - Business Services should report to the Deputy Director - Customers (Mid Term)
  - Intergovernmental Relations ("IGA"), Public Information Office ("PIO") and Conservation Office ("PIO/Conservation") should be moved to Management Services (Short)
  - Mayor and Council function should be consolidated with IGA and moved to Management Services (Short)
- Business Services
  - Create a new Budget section consisting of O&M, CIP, Assets, and Special Projects (Short)
  - Accounting & Finance section should be eliminated (Short)
  - New Billing Systems section should be added with an IT specialist position and Management Coordinator (Mid Term)
  - Management Analysis group should be moved to Management Services (Short)
- Management Services
  - Create a new Division reporting to Deputy Director – Customers (Short)
  - Consists of Employee Services (HR, Safety), Front Office Support; Strategic Services, Management Analysis, and PIO/Conservation (Short)
  - Add a new Administrator position (Short to Mid Term)
- Customer Services
  - Metering now includes Automatic Meter Reading ("AMR") and Routine Replacement sections (Short)
  - Add Billing, 24/7 Dispatch Center, Customer Inquiries, and Internet/Counter sections (Mid to Long)
- Water Quality
  - Rename Water Quality and Operations (Short)
  - Operations should consist of Production and Quality Control (Short)
    - Production includes Plants, Reclaimed Water and SCADA

        - SCADA section also includes a planner/scheduler position moved from prior section.
        - Quality Control includes Labs, Backflow /Reclaimed, Water Quality Compliance, and Maintenance Management Program

Maintenance

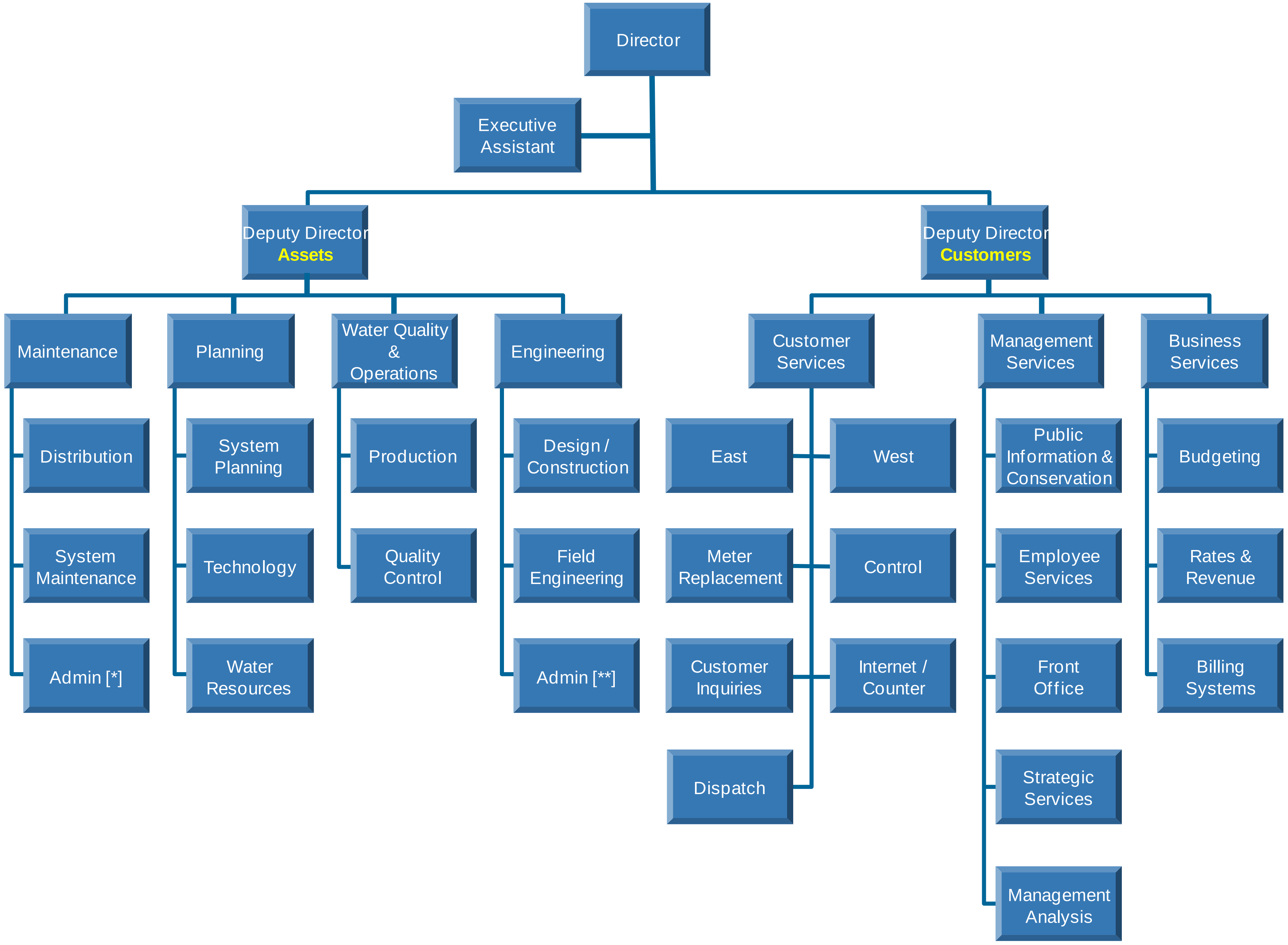
    - Maintenance includes Distribution and Systems Maintenance (Short)
    - Under Distribution, add two superintendents and move planner/schedulers to assist the superintendents (Mid Term)
    - Under Systems Maintenance, planner/scheduler position added (moved from prior section) to assist with maintenance scheduling activities, particularly with well maintenance (Short to Mid Term)
    - Under Operations Support (admin staff), eliminate management analyst position when EOS is reached (Short)
    - Fill the utility technician program trainer to address program refinements proposed (Mid Term)

- Planning and Engineering
    - Water Resources should be moved to under Planning section with retirement of Water Resources Administrator (Short)
    - Consider moving some water resource personnel to operations to increase cross-training opportunities and improve operations. For example, the Department could move the water resource testing group (well testers and well specifications) to operations and thereby improve coordination between the two groups. Such a move could be permanent, or implemented on a rotational/internship basis. The basis of the suggestion is to increase knowledge transfer between planning/engineering and operations (Mid to Long Term)
    - Move Backflow Prevention to Water Quality & Operations (Short to Mid Term)
    - Share Administrative staff, where practical (Mid to Long Term)

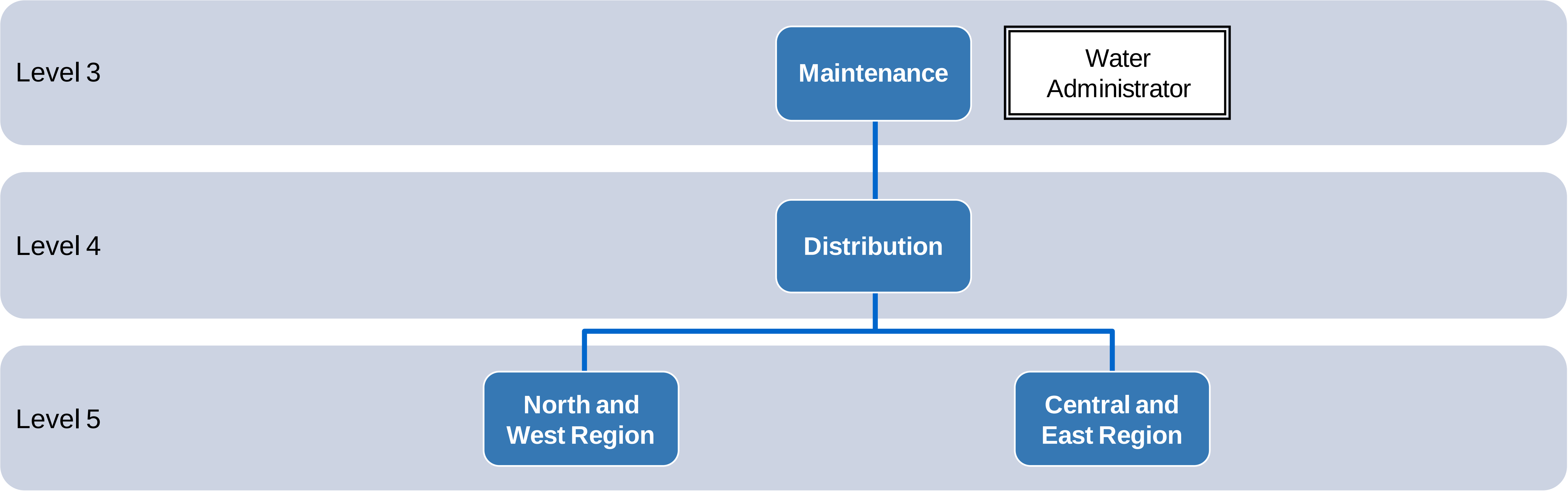
The impact of the change in FTE's is summarized in the following table:

Division	Current FTEs	Eliminated Positions	Positions Moved to /Added from Another Division	Added New Positions	Proposed FTEs
Director's Office	28.5		-24.5		4
Business Services	15		-3		12
Management Services	0	-1	28.5		27.5
Customer Service	122		10		132
Maintenance / Water Quality & Operations	251.5		-7		244.5
Planning & Engineering	136	-6	-4		126
Total	**553**	**-7**	**0**	**0**	**546**

Figure 2.4-1 Proposed Department Organization


Director
Executive Assistant
Deputy Director Assets
Deputy Director Customers
Maintenance
Planning
Water Quality & Operations
Engineering
Customer Services
Management Services
Business Services
Distribution
System Maintenance
Admin [*]
System Planning
Technology
Water Resources
Production
Quality Control
Design / Construction
Field Engineering
Admin [**]
East
West
Meter Replacement
Control
Customer Inquiries
Internet / Counter
Dispatch
Public Information & Conservation
Employee Services
Front Office
Strategic Services
Management Analysis
Budgeting
Rates & Revenue
Billing Systems

FINAL



Level 3

Maintenance

Water Administrator

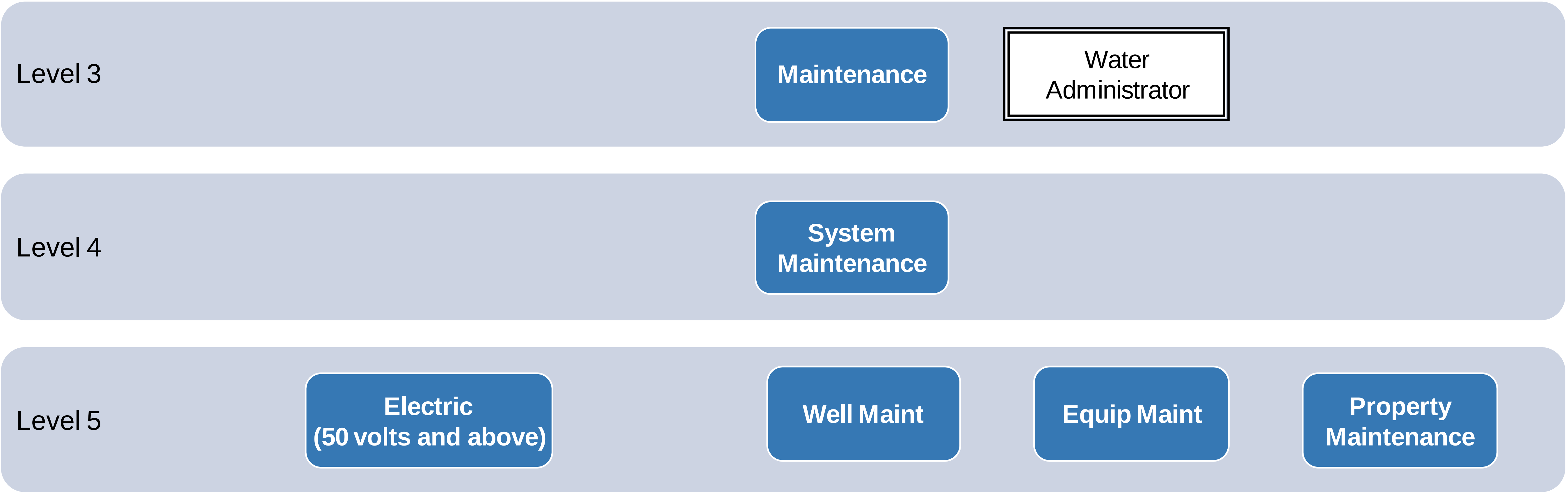
Level 4

Distribution

Level 5

North and West Region

Central and East Region



Level 3

Maintenance

Water Administrator

Level 4

System Maintenance

Level 5

Electric (50 volts and above)

Well Maint

Equip Maint

Property Maintenance

Level 3

Maintenance

Level 4

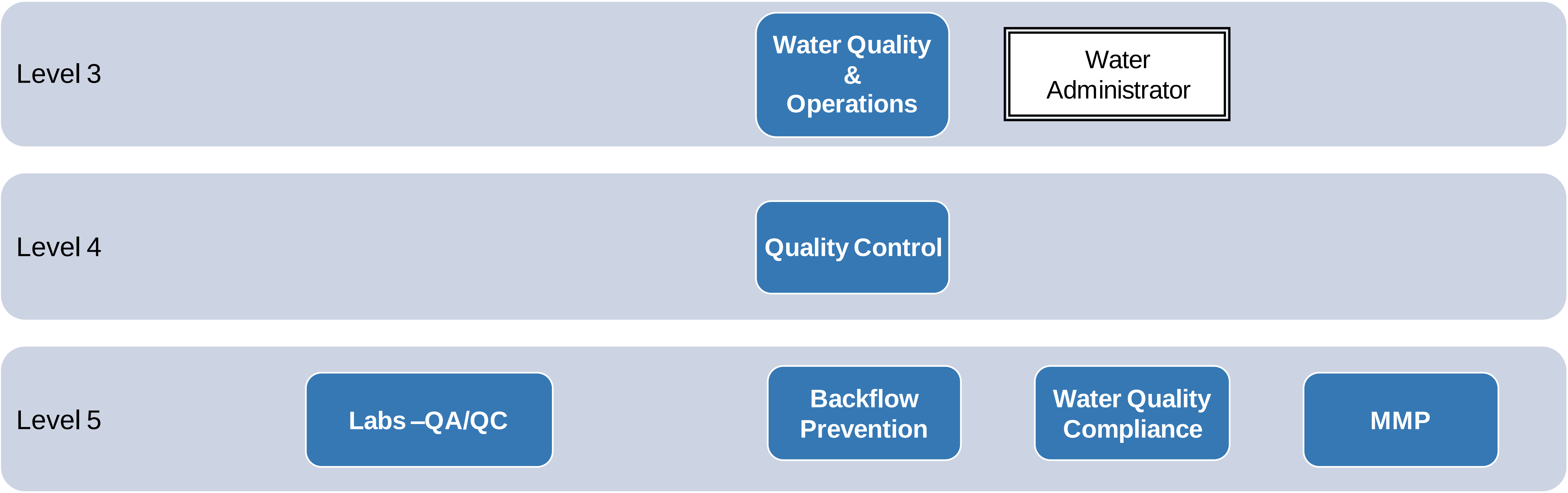
Staff Assistant

Level 5

UT Trainer

Office Supervisor

Stores



Level 3

Water Quality & Operations

Water Administrator

Level 4

Quality Control

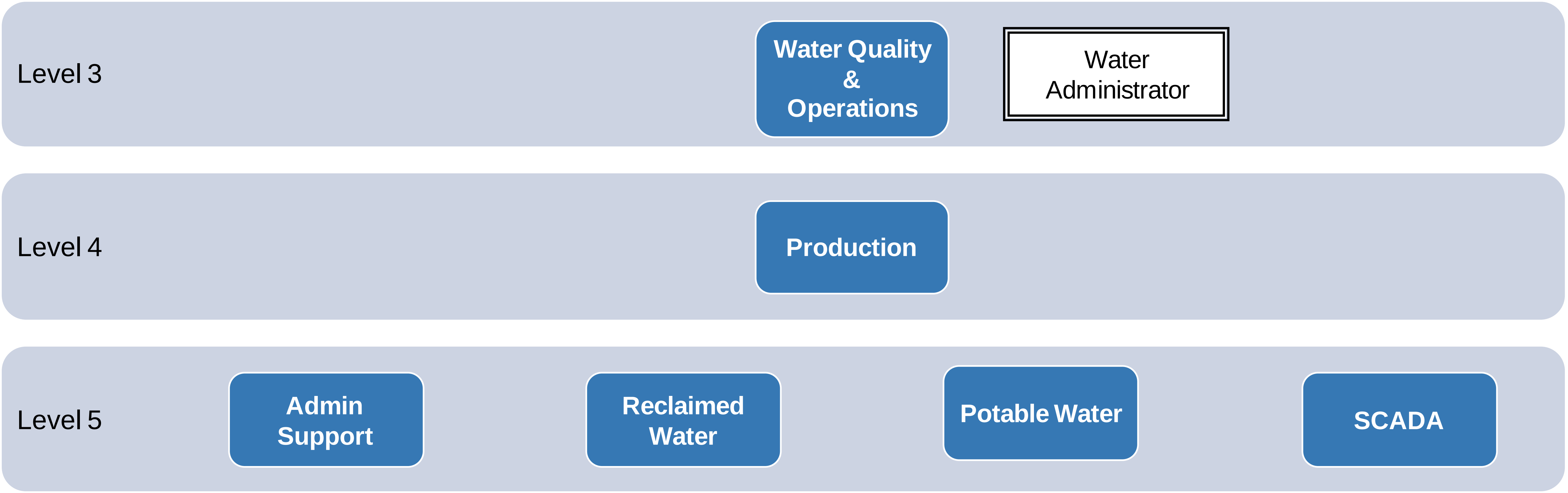
Level 5

Labs –QA/QC

Backflow Prevention

Water Quality Compliance

MMP



Level 3

Water Quality & Operations

Water Administrator

Level 4

Production

Level 5

Admin Support

Reclaimed Water

Potable Water

SCADA

Level 3

Planning

Engineering

Level 4

Staff Assistant

Management Assistant

Level 5

Office Supervisor

Level 3

Planning

Water Administrator

Level 4

System Planning

Technology

Water Resources

Level 3

Engineering

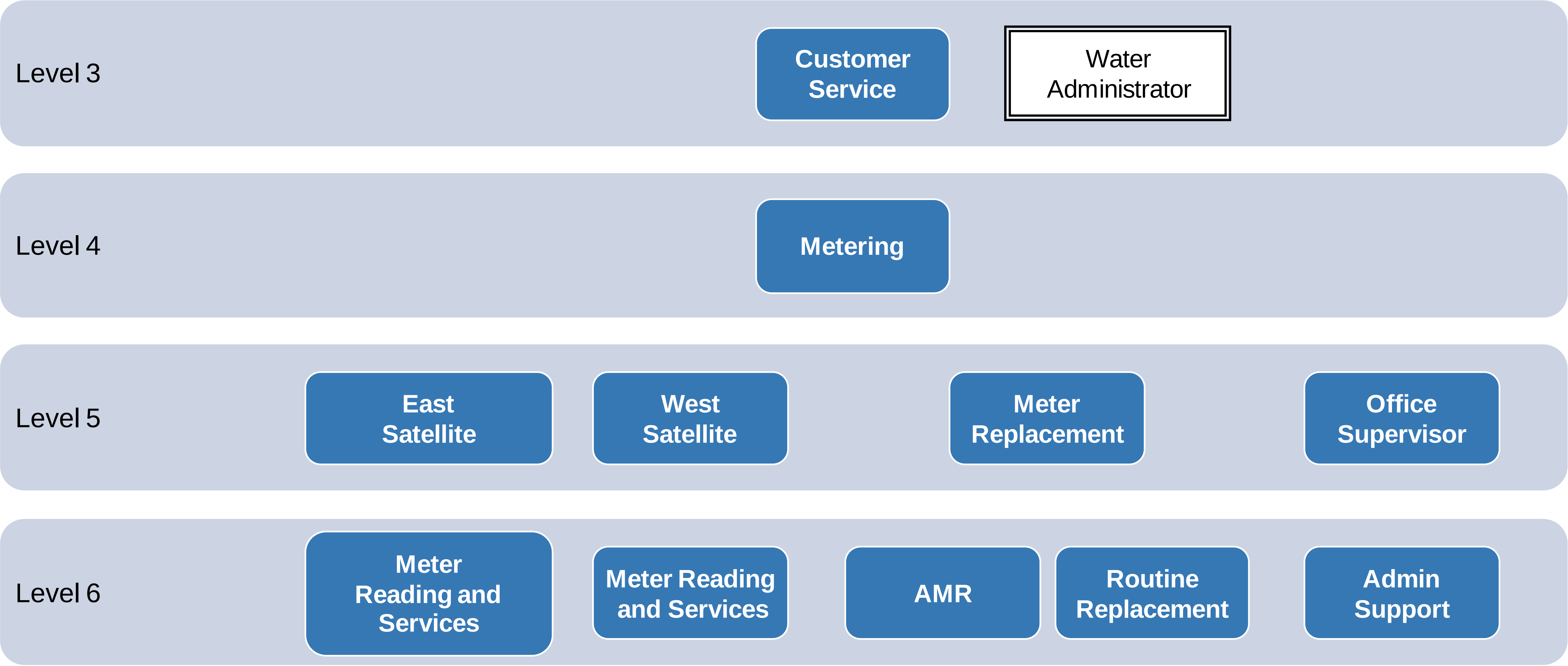
Water Administrator

Level 4

Design Construction

Field Engineering

Level 3		**Business Services**	Water Administrator
Level 4	**Budget**	**Rates & Revenue**	**Billing System**
Level 5	**CIP / Assets O&M Budget Special Projects**	**Rates & Revenue**	**Billing System**



Level 3

Customer Service

Water Administrator

Level 4

Metering

Level 5

East Satellite

West Satellite

Meter Replacement

Office Supervisor

Level 6

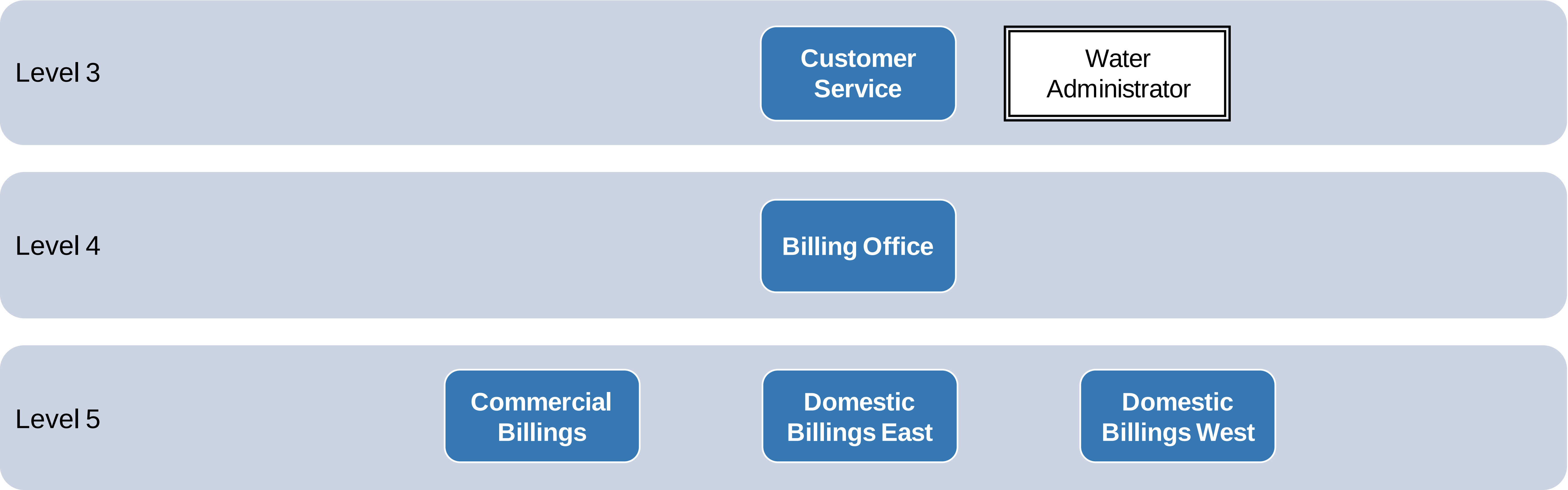
Meter Reading and Services

Meter Reading and Services

AMR

Routine Replacement

Admin Support



Level 3

Customer Service

Water Administrator

Level 4

Billing Office

Level 5

Commercial Billings

Domestic Billings East

Domestic Billings West

Level 3

Customer Service personnel needs to be reallocated to level 5 functions based on additional studies

Customer Service

Water Administrator

Level 4

Billing Office

Level 5

Team 1
Control
Bank Draft
Delinquents
Clerical Exceptions
Low-Income
Tampering
Stuck Meters
Final Bills
Citation Program

Team 2
Telephone
All Phone Inquiries
Residential
Commercial
Industrial
Interactions

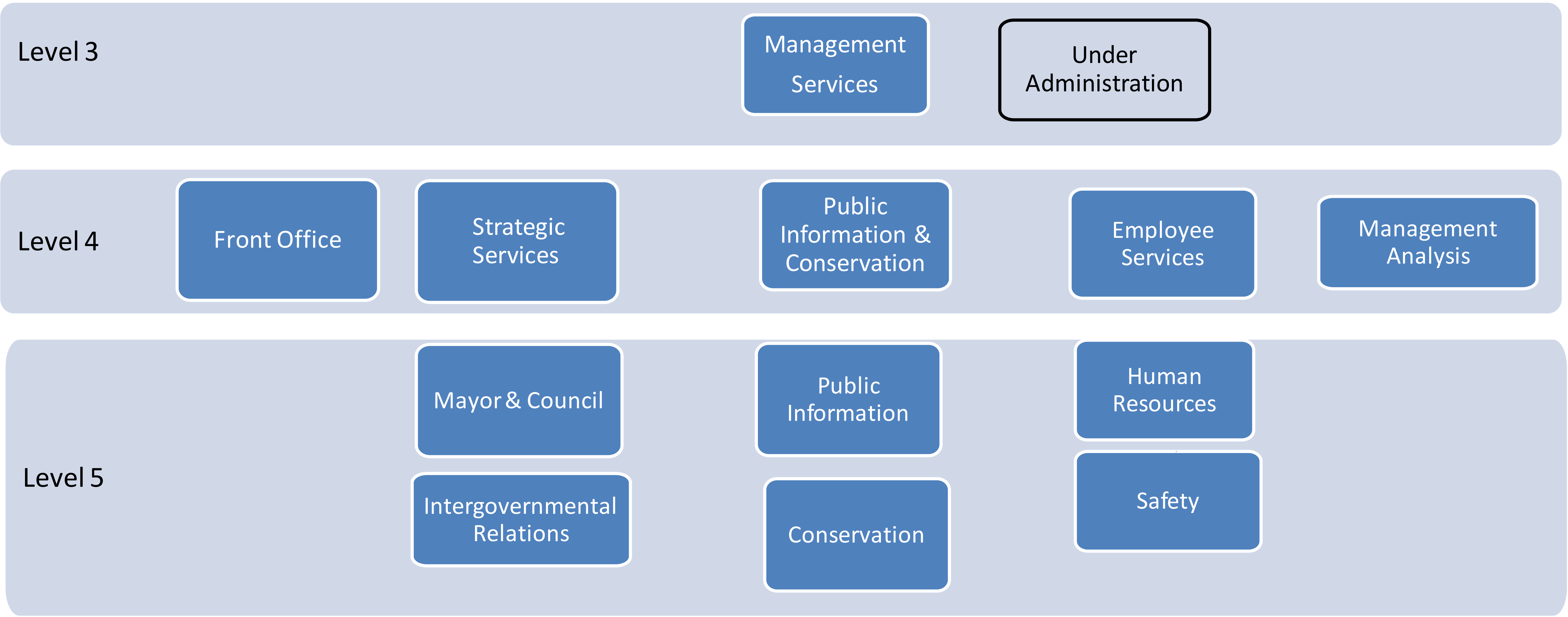
Dispatch for field turn on/offs

Team 3
Telephone
All Phone Inquiries
Residential
Commercial
Industrial
Interactions

Dispatch for field turn on/offs

Team 4
Internet turn on/offs
Web-based Inquiries
IVR messages
Counter / Walk ins
New Area Development
Customer Outreach

Dispatch


Level 3
Management Services
Under Administration
Level 4
Front Office
Strategic Services
Public Information & Conservation
Employee Services
Management Analysis
Level 5
Mayor & Council
Intergovernmental Relations
Public Information
Conservation
Human Resources
Safety

3. Current Operating Conditions

As part of the “as is” assessment, Black & Veatch reviewed the existing staff’s ability to perform maintenance to conform to the communities desired level of service, reliability, and quality. We also determined if changes in staffing levels may be necessary to increase preventative maintenance.

Black & Veatch personnel visited the Department’s largest water facilities, Plant 1, Hayden Udall, Eastside Metering, La Entrada administrative offices and conducted field interviews. More than 30 employees provided their time and insight of the utility over five days.

Discussion with each employee covered a range of the topics specific to the employee’s area of responsibility. Topics included, but were not limited to:

• efficiency	• service levels	• cost of service
• use of technology	• organizational structure	• operations and maintenance budgets
• capital improvements budget	• renewal and replacement budget	• work schedule
• water quality	• customer satisfaction	• age of infrastructure
• safety	• maintenance practices	• performance metrics

All employees interviewed were professional, courteous, and forthright. The overall sentiment of these employees and their outlook for improving the utility was very optimistic.

3.1 WATER MAINTENANCE DIVISION

Black & Veatch met with and interviewed representative employees of all sections within the Water Maintenance Division. Subsequent to these interviews, Black & Veatch project team members were given a walking tour of the Plant 1 Maintenance facility. The following provides a discussion of the division and related section areas of responsibility, interview and data research findings, and related recommendations. These recommendations are categorized into either short term and long term. Short-term recommendations could be done quickly to generate immediate benefits, where as long term recommendations may take years to accomplish and receive the benefits. To evaluate the operational effectiveness of the Maintenance Division, we probed into the following areas:

- Organization – A review of the current organization of the Water Maintenance Division
- Staffing – An evaluation of staff levels, succession planning, workload, training, and outsourcing/contracting
- Performance – Management reports, work orders, maintenance and inspections, quality assurance, system planning, overtime and interaction with other sections within the Division as well as with other Divisions within the Department.

3.1.1. Areas of Responsibility

The Maintenance Division performs all the following functions:

- Administers and maintains all water system facilities and assets. These includes all potable water production facilities, reclaimed water production facilities , and pipeline assets
- Administers all programs involving the computer-based process control systems utilized in controlling and monitoring the Utility's water systems
- Maintains construction equipment in support of the Utility's maintenance activities
- Installs new services
- Maintains the Utility's Avra Valley 25,000 acres of farm land as well as property for 1500 + addresses, treatment plants, reservoirs and other Department owned facilities
- Maintains fencing, and gates related to facilities security

3.1.2. Organization

This element comprised a review of the Water Maintenance Division organizational structure, spans of control, reporting relationships, and organizational changes in the recent past. The Division is divided into functional areas:

- 4 Maintenance Areas - North, West, Central, East
- Quality Control - Pipeline Protection, Corrosion Control, Bluestake pipeline location
- System Maintenance - Equipment Maintenance, Well Maintenance, Property Management
- System Support - Budget, Personnel, Procurement, Communication, Safety, Training

3.1.2.1. Findings

- The span of control for the Water Maintenance Administrator is currently at nine reports. Black & Veatch notes that in the past, the number of direct reports has been as high as 11. The Administrator also manages other vacant staff positions.
- Avra Valley farm property maintenance is a time- and resource-consuming effort conducted by the Division (Property Maintenance).
- System Support section span of control is disjointed and creates too many reporting functions.
- There are separate Supervisors over both Well Testing and Well Maintenance.

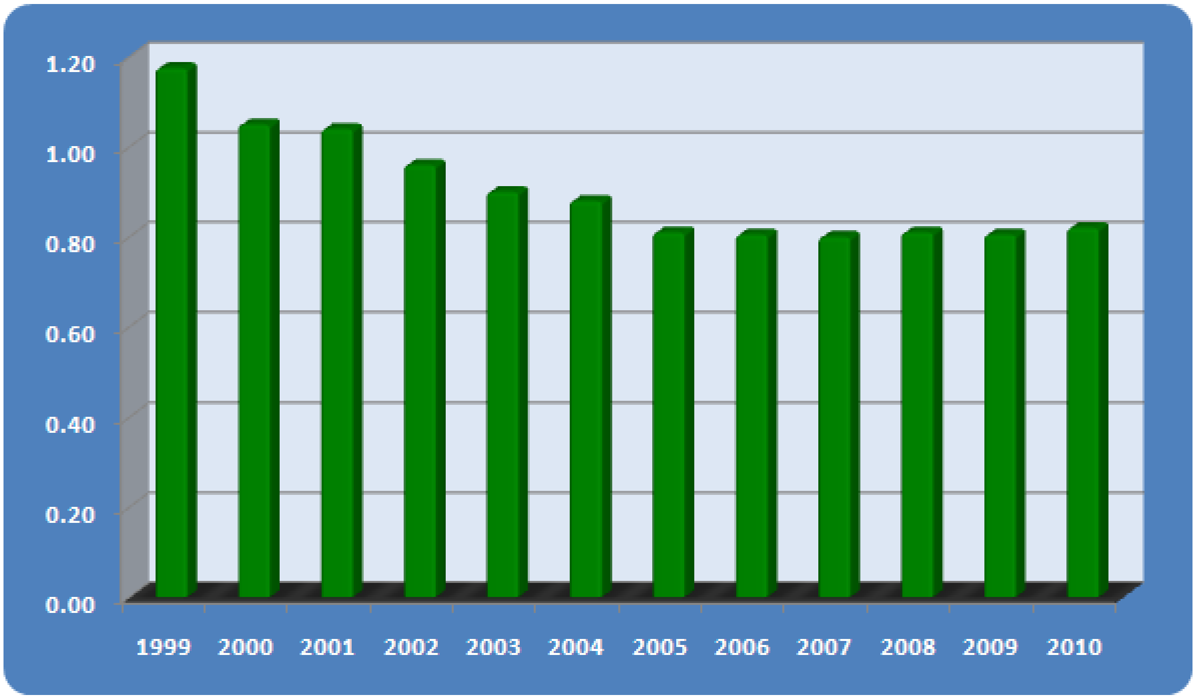
3.1.3. Staffing

There are 184 FTEs in this Division making it the largest Division within Department. The Division has a number of vacant positions that have not been filled and is facing 14 pending retirements this year. Furthermore, as the Division’s workforce continues to age, there is a need to continue to access the lost knowledge from the retirement of older employees. A large number of Division employees will retire over the next ten years yet there is no evidence of a coordinated succession plan for the Division. Such a plan would prove useful for re-organizing functions, streamline reporting processes, and identifying critical positions areas to be filled (and how they should be filled) or could possibly be eliminated. The Utility Technician classification offers a mechanism for succession planning built into the organization's maintenance business practices. The training and skill pay works to make time for training and motivation with pay for maintenance staff to progress through successive levels of career enhancement. Apprentice level workers can be grown into journey level workers over time thereby building a natural succession plan.

3.1.3.1. Findings

- Overall, the Maintenance Division has 14 pending retirements in 2011. Coupled with the number of current vacant positions, there is a cause of concern among most staff in the Division that the backlog will increase and quality of work will continue to suffer. Figure 3.1.3.1-1 illustrates the trend in fewer O&M staff per services and is based on O&M staffing numbers provided by the Department. It is likely this trend will continue as older Division workers retire over the next ten years unless new recruiting efforts are undertaken.

Figure 3.1.3.1-1 Attrition of Core Maintenance O&M FTEs per 1,000 Services



- This Division lacks a succession plan to fill these future vacancies. The Utility Technician classification coupled with the intended training and skill based pay system has the potential to create a systematic methodology that enables new hires to have a water maintenance career progression through the acquisition of skills and knowledge plus their associated pay.
- An expanding customer base and the expansion of the water distribution system needed to supply those customers, guarantees an increased demand for maintenance of existing and future system assets. Studies of the projected cost of staffing necessary to maintain these assets showed the need for many more employees or for major improvements in work efficiency to allow a smaller work force to handle the work

- Need to increase training (for example, maintenance work on large diameter main restraints and GPS equipment for Locators).
- Staff indicated that the Department's safety program (Five Star Safety) is not functioning as well as it could. Staff also indicated that the Department might be better off under the City of Tucson's safety program. Black & Veatch notes that success of the safety program is partially measured by risk (incident) reduction and so the benefits observed by management in the form of reduced accidents may not be fully recognized by staff. Additional communication regarding the benefits of the safety program (what does it mean to me) as well as making sure that the training conducted is relevant to staff (not a "one size fits all") would increase acceptance of this program.

3.1.4. Performance

For this section analysis, we relied on staff interviews, the Department's formalized performance measures, and Department documentation. We concentrated on the areas of planned versus reactive maintenance efforts and results, the use of technology, overtime expenditures, employee advancement programs and workflow processes.

3.1.4.1. Findings

- According to a May 9, 2011 *Percent of Planned Maintenance Work Orders* report, for the period of July 1, 2006 to May 9, 2011, only 36 percent of work orders handled by the Maintenance Division were planned maintenance efforts. The planned metric for the same period was 70 percent planned maintenance.
- According to the Department's documents, overtime expenditures in the Maintenance Division have been reduced $500,000 over the last 2 years. Some of the efforts that have contributed to these gains has been the introduction of a second shift (1:30 p.m. to 10:30 p.m.) and the implementation of a process to manage all overtime requirements.
- The division has reduced response time for emergencies to 30 minutes.
- To gain efficiencies, the division has made greater use of technology. The majority of division field staff had never used a computer; however it is now a daily occurrence, e.g. Synergen for work orders, service requests and time-keeping, and E-Map for distribution valve maps, access to as-built drawings and Red lines.
- In 2004, the Department implemented the Utility Technician program, a Skill-Based Pay Program that was instituted to develop a flexible and cross-trained workforce to better accomplish Department business objectives. The program is open to all employees in the Utility Service Worker (and Maintenance Mechanic) classifications. There is general consensus among staff that the program is not working as intended. Skill pay was frozen along with the City's merit pay in Fiscal Year 2008. The loss of the skill pay component removed the salary motivation behind betterment of skills by employees. The program is seen as a pay raise opportunity rather than a skills enrichment opportunity. Employees test to demonstrate mastery of a particular skill (and are compensated for demonstrating the skill), but are reluctant to engage in the skill on the jobsite, often times calling out better skilled employees.

- Technology is out of date (hardware, cell phones) or difficult for many staff to use. Field laptops are particularly out of date. Despite having two trainers continuously available, the trainers seldom receive requests from existing management staff to provide additional training other than to new employees. Synergen is complicated and challenging, taking up much staff time for data input. Any software system that meets the work management , data storage, and information retrieval requirements will be by design complicated and hence challenging.

- Journey Utility Technicians are first responders on TW call outs and claim they do not have the ability to know where to dig when first arriving at a job site. This claim is made even though they have available in their vehicles laptops with digital web based mapping of the water system assets, or microfiche, or even hardcopy map books.

- There is a belief among front-line staff that contractors are not billed for damage caused at work sites. Discussions with senior management indicate that a written process needs to be created. Additional training and development of performance metrics in this area is also being addressed.

- Maintenance is not able to regularly exercise significant numbers of valves , perform unidirectional flushing of lines, and or perform maintenance on public fire hydrants. The lack of valve exercising has caused crews excessive effort and time finding valves in order to shutdown a pipe segment .

- Dispatchers utilize three different systems (GIS, Billing, & Synergen) to perform their work causing inefficiencies and longer customer hold times.

- All calls go through one Dispatcher from 5:30 a.m. to 8:00 a.m (the night-shift plant operator). During emergencies, there can be workflow and customer service disruptions, e.g. recent February cold snap.

3.1.5. Recommendations

3.1.5.1. Organizational Recommendations

The following recommendations also address these specific EUM Attributes: Employee and Leadership Development; Operational Optimization; Operational Resiliency; Financial Viability; and Stakeholder Understanding and Support.

1) Perform another review of the organization in twelve to eighteen months to verify that the structure is adequately performing and is meeting the strategic goals of the City.
2) In the near term, consider the feasibility of the following organizational moves to potentially match similar process and/or skill sets:
   a) Move Water Control Systems Operation to the Water Quality and Operations Division/SCADA. This move would include the control system engineers and the electronic technicians.
3) In the near term begin efforts to contract out for property maintenance functions for the Avra Valley farm properties. This activity takes a significant amount of time of

Department staff and is not a good use of resources that could be dedicated to water operations and maintenance activities.

a) Assign a staff position to oversee the contractors to ensure the proper work is being performed since property maintenance is an important effort to the agency.

b) As part of this effort, the nine Equipment Operation Specialists currently working on Avra Valley farm property maintenance activities can continue to support other water system maintenance efforts. The current need for Equipment Operation Specialist support is significant and it is not anticipated that the staffing level can be decreased.

4) In the long term, consolidate reporting functions for:

   a) System Support functions (primarily Stores and Dispatchers) under one manager to reduce reporting requirements.

   b) Well Testing and Well Maintenance due to similar facility activities.

3.1.5.2. Staffing Recommendations

The following recommendations also address this specific EUM Attribute: Employee and Leadership Development.

1) Over the long term, the division should continue to review expected retirements and actively engage in recruiting, both internally and externally, to fill apprentice positions in a timely fashion to permit retention of experience and practical knowledge given the amount of time necessary to develop a fully qualified technical worker. This should continue until there is no more backlog of work.

2) A short-term succession plan should be developed immediately to actively recruit experienced replacements or cross-train existing staff within the next four to six months where re-assignment is warranted. A longer-term succession plan should be developed within a year to address those potential retirements that will likely occur over the next ten years.

3) In addition to the current retirement spreadsheets maintained by the Department, management reports should be developed immediately so that managers will have better information on the age and retirement status of their work groups. These reports can also help the Department understand if internal workforce development is covering long-term succession needs. These reports should be coordinated with the succession planning documents to achieve Department objectives.

3.1.5.3. Performance Recommendations

The following recommendations also address these specific EUM Attributes: Employee and Leadership Development; Operational Optimization; Infrastructure Stability; Operational Resiliency; Community Sustainability; and Water Resource Adequacy.

1) According to Department documents, the Maintenance Division was performing 95 percent reactive work and 5 percent planned maintenance efforts in 2002. While there has been improvement since 2002, the Division is still missing its metric of 70 percent

planned maintenance work. Staffing, organizational and workflow recommendations made in this report will greatly assist the division to achieve the 70 percent goal.

   a) A near-term solution to improve the percentage of planned work is to boost the implementation of the improvements previously identified by the Department during the Maintenance Management Program initiative.

   b) A longer term reinvigoration of the Department's Program Driven Maintenance initiative also supports increasing the percentage of planned work over reactive work.

2) Conduct comprehensive analysis to determine effectiveness of the Utility Technician, Skill Based Pay program soon, possibly this fiscal year. If the program is determined to be effective, some refinements may be necessary to maximize its efficiencies. If determined to be ineffective in its objectives, consider eliminating the program or revising its administration to minimize perception among staff that the program is managed to the benefit of a few. This program has undergone several revisions and refinements since its implementation in the early 2000s. The roll-out of an extended cross-training program should also address the following issues:

   a) **Practical demonstration of mastered skills.** Coursework for field-based skills needs to include a practicum as well as a minimum number of hours in the field before the skill level is "passed."

   b) **Increase accountability.** Increased pay for skills implies that there should be increased responsibility and accountability for performance to the new job level standards.

   c) **Pay advancement based on attaining new skills occurs when a position is available.** There are two cornerstone concepts behind the Utility Technician Skill Based Pay program. The first is a maintenance staff member possessing many of these thirty seven skills is more valuable to the Department due to the breadth of their cross training and multiple skills that creates efficiencies in the field. The second was that employees would receive a pay raise when they mastered each of thirty-seven progressively more critical water maintenance skills. Maintenance staff could progress through levels at their own pace from an apprentice, to craft and on into journey level. This is in contrast to the previous structure where one could only get a promotion when a vacancy occurred due to a staff member leaving the maintenance organization. The City of Tucson halted all compensation increases (merits and cost of living adjustments) due to the economy. This meant that participants in the Skill Based Pay program also did not receive increases for new skills earned. Skill Based Pay staff do not receive merits, but they normally would receive compensation for new skills earned. The maintenance staff in the Skill Based Pay program will be challenged to maintain the existing infrastructure and train new staff when the fourteen EOS participants leave at the end of December, 2011.

3) Consider over the long term the feasibility of either using Locators as first responders on call outs due to their ability and resources to know where to dig or increasing the locate capabilities of the Utility Technician first responders. If the first option is

followed this policy may require de-centralizing locators from Plant 1 and assigning them to regional offices to ensure quicker first responder services. Note that Arizona Bluestake still has to be called no matter who the first responder is because of the need to locate the other buried utilities.

4) Immediately start an effort to document billing for contractor damages between Maintenance and Finance that creates a written business practice, includes training for staff and incorporates performance metrics.
5) Continue operating the second shift (1:30 p.m. to 10:30 p.m.) program.
6) Consider focused technology training on all systems over the long term to ensure that all maintenance staff are adequately trained to take advantage of the tools the Department's technology provides. This recommendation is even more important for management personnel.
7) For the Synergen system, it has been suggested that a dedicated data staff person enter data from the field and process work orders so that Utility Technicians do not spend an inordinate amount of time on these functions. This might free them up for more field work, thus reducing backlog potentials. In the short term it is recommended that the concept of a data entry clerk for field crews be fully vetted. Also work flows associated with the system need to be analyzed and revised.
8) Update as soon as practical computers and cell phones for all technical field staff.
9) Immediately consider a back-up business practice for dispatchers during certain times such as 5:30 a.m. to 9:00 p.m. to handle workflow and customer services challenges during emergencies.
11) Encourage Employee Cross Training and Use. Many of the employees received cross training, however function within one target area. Manage resources at hand to address operational issues. The goal is to reduce the need for additional employees by making best use of existing employees. The UT Program is an excellent example of employee cross training. Expanding this philosophy to increase Department-wide communication and resource use will also provide increased organizational flexibility as well as present new career paths for employees. For example, consideration could be given to developing an internship-type program for water resource personnel to work with operations staff to address well maintenance/pumping matters.

12) Examine the feasibility of combining distribution yards and increasing use of satellite sites. In the past, as part of a strategic directive, the Department examined its facilities and made a decision to reduce windshield time and convert this time to more productive wrench time. As such, the use of satellite sites more does have merit – particularly for those employees who live near satellite sites. Interviews with staff indicate that there is a strong desire to work out of satellite sites if it means a reduction in commute time. Discussions with management suggest that such decisions are made at the operational level (Administrators and supervisors). If reduced commute time produces greater productivity from staff (and increased morale), then consideration should be given to using satellite sites for work places, so long as the work function being performed is amendable to such a "relocation".

With respect to consolidation of distribution yards, the Department would benefit from performing a detailed cost benefit analysis for reducing the number of yards (through consolidation) and perhaps moving towards a four-quadrant service area approach. Water Quality and Operations Division.

3.2 WATER QUALITY AND OPERATIONS DIVISION

Black & Veatch met with and interviewed representative employees of all sections within the Water Quality and Operations Division. The following provides a discussion of the division and related section areas of responsibility, interview and data research findings, and related recommendations. To evaluate the operational effectiveness of the division, we looked into the following areas:

- Organization – A review of the current organization of the Water Quality and Operations Division
- Staffing – An evaluation of staff levels, succession planning, workload, training, and outsourcing/contracting
- Performance – Management reports, work orders, maintenance and inspections, quality assurance, system planning, overtime and interaction with other sections within the Division as well as with other divisions within the Department.

3.2.1. Areas of Responsibility

The Water Quality and Operations Division performs all the following functions:

- Provides water quality sampling, analyses, and treatment to ensure that the highest quality water is available to its customers (both reclaimed and potable water)
- Operates the Department Reclaimed Facility, Sweetwater Wetlands, Tucson Airport Remediation Project (TARP) Water Treatment Plant, the Hayden-Udall Water Treatment Plant, and the Clearwater Renewable Resource Facility
- Oversees all functions of water quality including operation of all water delivery facilities (reclaimed and potable)
- Maintains regulatory compliance with all state, county, and federal agencies as well as provides analytical support to the City of Tucson through its state-of-the-art laboratory facilities

3.2.2. Organization

This element comprised a review of the Water Quality and Operations Division organizational structure, spans of control, reporting relationships, and organizational changes in the recent past. The division is divided into functional areas:

- Environmental & Regulatory Compliance Section (ERC) - This section has the primary responsibility of ensuring all drinking water, reclaimed water, and other environmental programs within Department are administered to maintain regulatory compliance with local, state, and federal programs that pertain to water quality and operations

- Operations Section – This section manages, operates, and delivers the reclaimed water systems and the potable water system (plant as well) on a 24 hour, seven day a week basis.
- Laboratory Section – This section maintains a full service environmental laboratory that is licensed by the State of Arizona.
- Maintenance Management Program (MMP) – This program is an on-going, long-term effort to improve the maintenance of the assets required to produce, treat, store and distribute both potable and reclaimed water.
- Administrative/Clerical Section – This section provides administrative and clerical support to the division by processing employee payroll, maintaining personnel records, initiating and monitoring purchase requisitions, and processing invoice payments.

3.2.2.1. Findings

- The span of control for the Water Maintenance Administrator is currently at 10 direct reports.
- There are 9 vacant and end of service positions in this Division.
- The Water Quality and Technical Support sections, comprising of Reclaimed Water Operations and Customer Support appears to be a “catch all” of various disciplines and functions. Functions could be moved to other sections within the Divisions where skill sets, workflow process and expertise areas are related.
- The Engineering Manager over the Water Quality Technical Support and Development is often involved in Engineering Design review so some of this position’s duties are not related to customer service functions related to the Customer Support unit.
- The TARP project fell under ERC as of August 2010.

3.2.3. Staffing

There are 70.5 FTEs in this division. The division has five vacant positions that have not been filled and is facing 4 pending retirements this year. Furthermore, as the division’s workforce continues to age, there is a need to continue to access the lost knowledge from the retirement of older employees. A large number of division employees will retire over the next ten years yet there is no evidence of a coordinated succession plan for the division. Such a plan would prove useful for re-organizing duplicate functions, streamline reporting processes, and identifying critical position areas to be filled (and how they should be filled) or possibly eliminated.

3.2.3.1. Findings

- Because of the division’s vacancies and pending retirements this year, there is a cause of concern among most staff in the division that a backlog of necessary maintenance work orders will increase and quality of work will continue to suffer. It is likely this trend will continue as older division workers retire over the next ten years unless new recruiting efforts are undertaken.
- Staff indicated that due to vacancies not being filled, site visits by staff from all areas (disinfection, water quality sampling, maintenance) are cut short to meet work flow requirements. Anecdotal comments indicate that often site visits are less than 10 minutes in

duration and there is consensus from staff that increasing site visit times to the 15-minute mark would be beneficial.

- **Re-evaluate plant staffing levels.** Within the water industry, the implementation of automation has decreased the need for staffing at water treatment plants. Black & Veatch notes that the higher the level of automation, the fewer personnel may be required for operations, but more instrumentation technicians are needed. Likewise, the more complex the treatment processes, the more personnel will be needed to operate and maintain the systems.

  It is important to note that the Department does not have any significant treatment plants due to the current water supply mix. The Department does have a supervisory control and data acquisition ("SCADA") upgrade project planned for 2012 and anticipates that issues such as having two 24/7 staffed control rooms and "dark" control rooms should be addressed as part of implementing the SCADA Master Plan.

3.2.4. Performance

For this section analysis, we relied on staff interviews, the Department's formalized performance measures, and Department documentation. We concentrated on the areas of procurement process, training, technology, employee advancement programs and workflow processes.

3.2.3.1. Findings

- Staff interviews indicated that there is a reduction in travel and formal training for many front-line employees. As a result, in-house staff conducts informal training sessions, e.g. Senior Chemists are training others in the laboratory on certain equipment.
- There does not seem to be clear understanding of the procurement process for laboratory equipment, materials and supplies. While it is the Department's policy that lab personnel order the needed supplies and have administrative staff make payments, this does not occur all the time. Interviews with staff indicate that there are several instances whereby while lab personnel know what is needed, they are not ordering these materials (City of Tucson Procurement performs this role) and often mistakes in ordering are made.
- Compliance Management tracking is not automated. Currently, Compliance Management tracking is concentrated with one person. The Department is looking into automated compliance software and anticipates moving to an automated system once funds become available.
- Work order close out procedures with Maintenance are not coordinated. Operators are often uninformed about maintenance issues, particularly as they are closed out. It is essential that the Maintenance staff notify the Water System Operator that the work order tasks are completed.

3.2.5. Recommendations

3.2.5.1. Organization Recommendations

The following recommendations also address these specific EUM Attributes: Employee and Leadership Development; Operational Optimization; and Water Resource Adequacy.

1) Perform another review of the organization in twelve to eighteen months to verify that the structure is adequately performing and is meeting the strategic goals of the City.
2) Consider the feasibility of the following organizational move to potentially match similar process and/or skill sets:
    a) Move Reclaimed Water System operations to Water Treatment Plant Operations
    b) The Department temporarily has Reclaimed Water System Operations reporting to the Operator of Record and a Manager. These personnel are not always in step with each other. A more direct reporting line may be more efficient. Black & Veatch notes that it is the intent of the Department to address this temporary situation once the disinfection and reclaimed supervisor positions are filled.
3) Consider oversight of TARP project by a Water Operations Superintendent or similar role.

3.2.5.2. Staffing Recommendations

The following recommendations also address this specific EUM Attribute: Employee and Leadership Development.

1) Through a potential re-organization of staff and functions, backfill end of service and vacant positions.
2) A short-term succession plan should be developed immediately to actively recruit experienced replacements or cross-train existing staff within the next four to six months where re-assignment is warranted. A longer-term succession plan should be developed within a year to address those potential retirements that will likely occur over the next ten years.
3) In addition to the current retirement spreadsheets maintained by the Department, management reports should be developed so that managers will have better information on the age and retirement status of their work groups. These reports can also help the Department understand if internal workforce development is covering long-term succession needs. These reports should be coordinated with the succession planning documents to achieve Department objectives.

3.2.5.3 Performance Recommendations

The following recommendations also address these specific EUM Attributes: Employee and Leadership Development; Operational Optimization; Infrastructure Stability; Operational Resiliency; Community Sustainability; and Water Resource Adequacy.

1) In the long-term, consider evaluating Department’s sanctioned training programs for staff at appropriate levels to ensure required coverage of training needs.

2) Automate Compliance Management tracking, possibly with the new LIMS when it is installed.
3) Immediately improve business practices to better coordinate Work Order close out procedures between Maintenance and Operator personnel.
4) Reinforce the policy for utilizing the Department Dispatch system for call outs on Reclaimed Water work orders.

3.3 ADDITIONAL RECOMMENDATIONS FOR AREAS OF IMPROVEMENT / AREAS OF INVESTIGATION

Evaluate specific elements of the Five Star Safety Program for applicability.

The City of Tucson safety programs which are administered by the City Central Safety Services Section (“CSS”) are detailed in the City Occupational Health and Safety Manual. CSS provides basic resources for compliance with the Occupational Health & Safety Administration as it relates to employee safety. These City programs are incorporated into the Department’s 5 Star Safety System.

The Tucson City Council in 2000 approved TW to participate in the 5 Star Safety System, an international system of safety and loss control standards. This was to help the Department identify and eliminate the root causes for multiple serious injuries that equated not only to long term Workers Compensation claims, but high City insurance rates. Just as a hotel or restaurant grading system readily identifies world’s best in class, the 5 Star grading system for safety identifies the best in safety practices. This rating system provides an in-depth evaluation of safety performance in five areas: (1) premises and housekeeping, (2) mechanical, electrical and personal safeguarding, (3) fire protection and prevention, (4) incident recording and investigation, and (5) safety organization. There are 73 basic elements and over 500 additional measures of safety performance evaluated and scored. In support of this program, TW employees receive training in hazard recognition, accident investigation, critical incident analysis, and safety auditing.

The CSS does not have a programmatic approach to measure the effectiveness of the other than annual, one time site visits known as Multi Agency Inspection Team (MAITS) inspections that are visual observations that creates repair punch lists for corrective actions. The 5 Star Safety System requires dedicated staff assigned to document, maintain, monitor and improve the program and is responsible for audits, site inspections and related training.

According to feedback specific requirements of the 5 Star Safety System may not be applicable for the current operation. Reporting may be excessive and therefore result in lost time. The benefits of the Five Star Safety Program should be continuously communicated to staff, particularly those in the field. At present, staff is not able to see the benefits of the program compared to the level of effort necessary to achieve a 5 Star rating.

As seen in Figures 3.3-1 and 3.3-2, the benefits of the 5 Star Safety System over the last few years have been a reduction in Frequency Rate (number of lost time injuries) for the Department, as well as decreased injury rates. This reduction also affects the rate charged by the City for indemnity costs.

Figure 3.3-1 Lost Time Injuries per 100 Employees

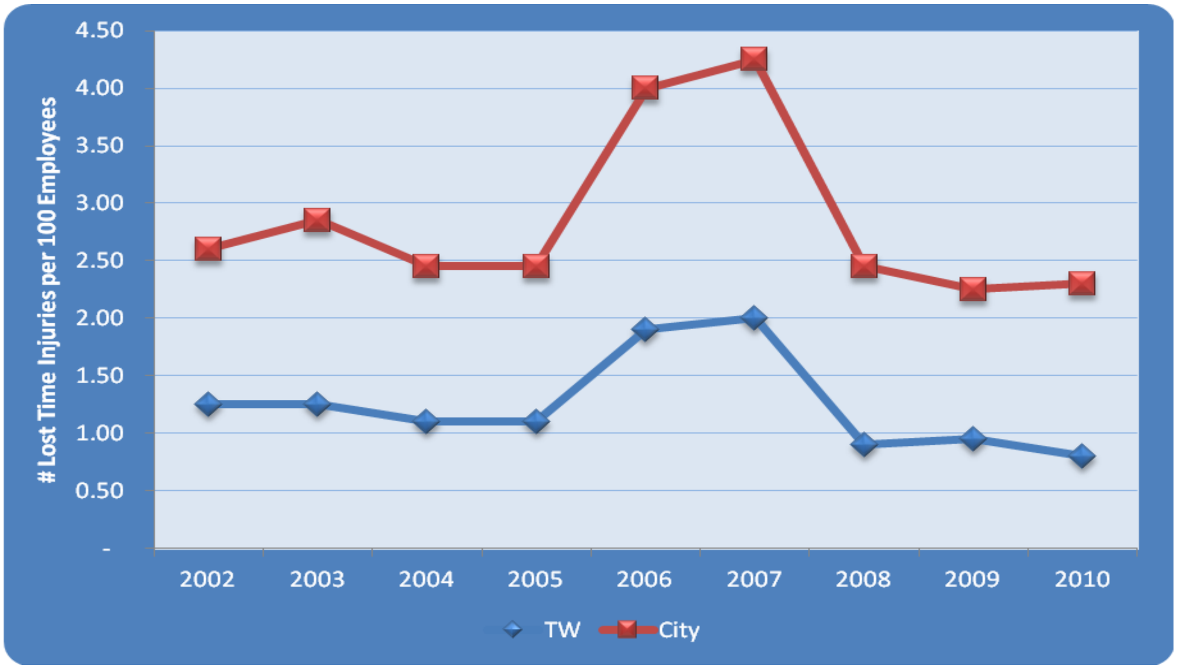
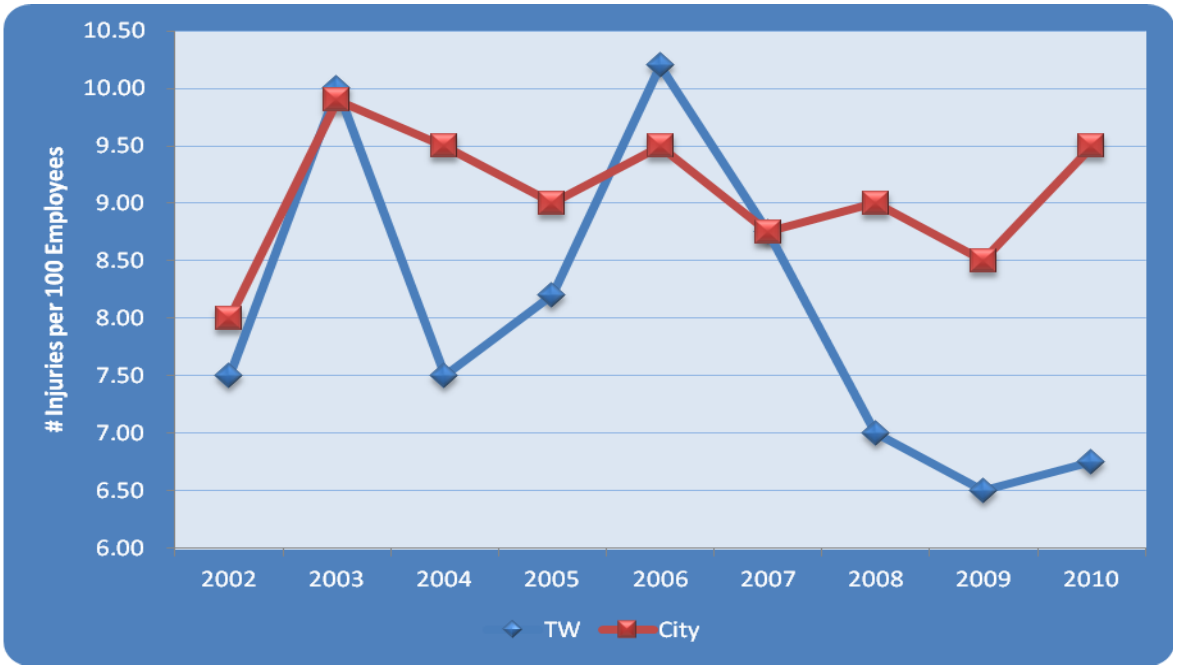


Figure 3.3-2 Number of Injuries per 100 Employees



4. Customer Service Evaluation

Customer Service is a key function within a utility and it is of paramount importance to the City. For many citizens, interaction with the City's customer service group represents their first encounter with the City. As such, any decline in customer service quality is of significant concern to the City and Department. As part of this study, the City has asked Black & Veatch to evaluate the Department's Customer Service organization including Billing, Remittance Processing, and especially the Call Center. It is our understanding that there is a strong desire on the part of the City to improve customer service, while also managing cost more efficiently. Our assessment identified both areas of progress and a number of opportunities for improvement. Additionally, to assist the Department as it works on improving call center performance, we have included a number of suggested monitoring, reporting, communication, and organizational tools that may be used.

Many utilities are caught in a "service / cost dilemma". In the case of the City, customer service (via the call center), by most standards had dropped to unacceptable levels. There is also a City-wide need to manage cost in order to limit rate increases. The City faces difficult choices regarding the best strategic approach to managing this service / cost dilemma in the Department's call center. Since the start of this organizational review, Tucson Water has achieved significant improvements in hold times. Currently the call center is answering approximately 90 percent of their calls, with about ten percent of the calls being abandoned. The majority of the calls are now answered within one-five minutes. Although they have not yet achieved their goal of 80 percent of all calls being answered within 30 seconds, enormous improvement has been made. Additionally, the number of calls received by the call center continues to climb. A new "normal" of 50,000 calls has occurred; the call center received 80,000 calls in the month of December, 2011.

This section provides insight into opportunities to improve both service and efficiency. Black & Veatch used the following approach to collect information about the Department's customer service operations:

- Conducted interviews with customer service representatives ("CSRs") over the course of four days.
- Interviewed CSR supervisors
- Observed calls and back office work being performed and discussed observations with employees

4.1. OVERVIEW OF CURRENT SITUATION AND OPPORTUNITIES

Black & Veatch used what we learned from data, interviews and observations to determine the following key findings about overall customer service performance and primary opportunities for improvement. The Department is looking to improve their call rate down to a 30-second hold time. Current industry standards are that CSRs should answer 80% of calls in the first 30 seconds. The following discussion is broken out by CSR Interviews Findings, Environment, Communications, Metrics, and Industry best practices to achieve quicker response times and Call Center synergies. As part of the review, Black & Veatch only reviewed system tools from a high-level perspective. The current system technology has great impact to call response time due to cumbersome and multi entry system. This chapter does not go into the solution of technology assets that are currently in place at the Department. However, Black & Veatch does recommend that the Department should review assets, tools, and business process to improve ongoing efforts.

4.1.1. What is Working Well

The Department's Customer Service organization has the foundation to provide effective service on behalf of the City. The Department staff was very cooperative and openly shared information with Black & Veatch representatives. Following are several observations that indicate there is a foundation for improving Customer Service performance.

- We would characterize the Customer Service staff as genuinely caring about customer service and about their performance for their customers and for the City. Although morale is challengine, team members take pride in their work and have a strong desire to "do the right thing."
- Customer Service management is well aware of several of the issues described in this report, and they are taking actions and have plans for addressing them.
- We found several very knowledgeable people in key positions.
- Management has recognized the difficult problems they face, and they have demonstrated a willingness to be creative with solutions as evidenced by the recent consolidated organization. The Customer Service organization has achieved tremendous improvements in call handling times over the last few months.

4.1.2. Field Observation and Areas for Improvement

From an overall customer service perspective, the Department's call center is experiencing numerous challenges that are causing a large increase in customer service complaints. For example, calls are generally not answered in a timely-enough manner; call abandonment rates are still high; and too many calls appear to be blocked. Inconsistent practices on the part of call takers, caused by insufficient training and a lack of ongoing coaching, contribute to a less-than-optimal customer experience. Delays in processing back office work may also adversely affect customer service.

Based on Black & Veatch's experience, field observations, and analysis of Department-provided data, the overall staffing level of the Customer Service organization appears adequate to handle call volumes, but other functions need to be augmented by additional staff.

- Refinement of the current business process to fine-tune how the office is operated is needed.
- Reduction of the number of metrics being used to monitor performance. As will be discussed later in this chapter, metrics are needed to help improve employee performance. Currently, the number of metrics being measured and applied is creating high levels of stress among staff.
- Shift vacant positions from other areas of the department as call volumes dictate and/or add more positions to the section.

4.1.2.1 Service Desk Recommendations

Black & Veatch suggests that the Department can improve work levels at the billing and service desks by implementing the following changes:

- Staff three bodies to handle Internet business. This will free up CSRs to handle just phone call volumes.
    - When high volume occurs or breaks the Internet desk can back fill as phone CSR
- Internet functions should be broken out into two desks.
    - Inquiries
    - Turn on /Turn offs.
- It is recommended that three new positions be hired for these duties.
- Use existing 38 members of CSR team to only take calls, this gives greater team cohesion and attention to get the phone work complete without having to jump back and forth so CSR can concentrate on calls.
- Hire the two CSR opening positions as soon as possible to give time to come up to speed prior to November retirements. To be in place by November the two new CSR hires need to take place in August.
- Use experienced CSRs to answer calls outside of the normal turn on/off.
- Ensure the CSRs are trained on turn on/off and all other calls, both Commercial and Residential.
- Ensure the nine member Control Team coordinates all exception work..
- Increase on-the-job training for all CSRs. Due to the nature of the call center and high volume of longer calls and budgetary restraints, training has been virtually nonexistent. Black & Veatch recommends on the Job training with mentors of senior personal over at least a six-month timeframe.
- Continue staffing Walk ins at current levels
- Continue staffing low income service desk with one CSR and one back up CSR
- Customer Service will need at least five more CSRs.
- Retrain staff on service desk procedures. Black & Veatch observed that team members inconsistently applied polices with customers. Creating “cheat sheets” and increasing communications regarding current policies and procedures will help staff in this area.
- Black & Veatch suggests that a staffing level of 39 personnel is adequate to answer current call volumes. Staffing levels need to be balanced and flexible for the 3 areas recommended.

- To be successful team members need proper time to complete calls right the first time. Quality Service is cut due to the fast pace and trying to reach the 30-second goal. However, time needs to be taken to get work done correctly the first time, thereby reducing rework and call back.

4.1.2.2 Work Environment

Black & Veatch notes that to facilitate the new staffing levels, the current floor plan for the service area needs to be expanded or new area found. The current service center is non- conductive to CSR work.

- CSR workspace is too compact with customers able to hear other customer conversations.
- Current environment is not conducive to properly service customers.
- Current work environment will not handle consolidated staff.
- Safety concerns in current environment with past incidents of customers gaining access to service center.

4.2. DATA, REPORTING AND METRICS FINDINGS

The following sections show the current year to date metrics for the Department's call center. The metric areas captured are: Subject of calls by percentage, Abandon rate calls, Average Handle time ("AHT"), and Percentage of resource per call per hour.

The findings show that the type of calls for Inquiry for High Bill, Delinquent Inquiry and Bill Inquiry is 75% of total coded calls. At the time of this study, there was not a system average handle time broken down by these categories. Black & Veatch recommends that the Department conduct an analysis on getting the metrics associated to the time broken down on Inquiries. As identified during the review process, CSRs noted that the call types have changed in the last three years from Turn on/Offs to higher volume, more intensive Inquiry calls.

4.2.1. Call Volume per CSR and Subjects by Call

Table 4.2.1-1 summarizes the Department's call volume per CSR metric. With the proposed new staffing level and workflow changes, the new Customer Service organization will be able to handle 1,000 additional calls per day. The benefit of the proposed changes is that abandon rates can be reduced and more calls will be taken. Table 4.2.1-2 presents the year-to-date results for Subjects by call and provides the Department an indication of areas that need attention.

Table 4.2.2-1 Call Volume per Customer Service Representative (for the Period April 2011 through September 2011)

Daily Call volume CSR Average	
Current level calls CSR per day	100
Current call volume an hour per CSR	12.5

Table 4.2.2-2 April 2011 Year-to-Date Percentage by Code, Subject of Calls

Subject of Calls	Total	%
Turn on/offs	19,019	18%
High Bill inquiry	8,686	8%
Pressure Complaints	111	0.10%
Water Quality	223	0.21%
Outages	448	0 .43%
Delinquent inquiry	52,537	50%
Bill Inquiry calls	17,211	17%
Sewer calls	1,715	1.64%
Credit card payment request	920	0.88%
Realtor service inquiry	825	0.79%
Click to gov problems	393	0.38%
Transfer to environmental services	601	0.58%
Owner questions	307	0.3%
Leaks at Meter/property	543	0.52%
Back Billing dispute	137	0.13%
IVR issues	284	0.27%
TOTAL	**103,960**	**100%**

4.2.2. Average Handle Time

The Department’s average handle time is measured by “time it takes on the call” + After Call Work (“ACW”) = Total handle time.

As shown in Table 4.2.2-1, the Average Call Distribution per CSR is 7.6 minutes; this is well within normal call center standards. We note however that the Department should capture these average times for the subject of all calls to see the trend in type of work and how long it is taking to handle the calls. Further, we note that the after call work is an issue and should have more attention paid to the times by category of call.

Table 4.2.2-1 Average Handle Time

AHT	Minutes
Average Handle Time (AHT)	3.6
After call Work (ACW)	2.4
Total Handle Time	**7.6**

4.2.3. Abandon Rate

Currently, the Department’s abandon rate is 10 - 12%. In comparison, the industry average sets a goal of around 2%. Black & Veatch attributes the higher-than-desired abandon rates may be partially due to limitations with the current phone system. For example, customers may abandon calls because there is currently no ability for the system to let them know what the average wait time is before a CSR gets to them. There is also not an option for the customer to go back and select any options once they have passed the prompt. Instead, the customer goes into limbo once they pass the automated response section when they go on hold. This particular set of limitations is a technology-related matter and Black & Veatch recommends that the Department address these issues as part of a comprehensive technology evaluation. Finally, the automatic call distributor ("ACD") does not pick up calls abandoned due to a busy signal; consequently, the actual Abandon rate may likely be higher than 10%.

4.3. BEST PRACTICES RECOMMENDATIONS

When improving a call center, team, and individual performance goals, it is important to link them to the organization's mission, vision, and goals. A mission statement describes the purpose of the organization. It defines why the organization exists, and, therefore, how it operates and makes decisions. The vision statement for an organization is a bit different in that it describes where the organization wants to be at some point in the future. This vision drives the strategy of the organization as a whole, which in defines the strategy and performance goals of the call center, as well as the performance goals and standards for each individual within the organization. To support a Call Center goal to expand accessibility and increase caller satisfaction and retention/conversion, goals may be set for "one and done" completion by each access channel, such as telephone or e-mail, or each team may set goals related to "conversions," customer satisfaction ratings, or quality scores. Likewise, the organization defines performance metrics to gauge how well each team supports the mission and goals. Another way to think about defining performance measures is to think about what is required to keep the various call center stakeholder groups satisfied. There can be many different call center stakeholders, but the four primary stakeholder groups for Call Centers are customers/callers, the frontline staff, the providers' senior management teams, and the Call Center funder. The Department should balance the call center's performance goals and measures among these major stakeholders. Black & Veatch suggests using the basic concerns of these groups as a structure for defining the key performance indicators for the call center.

4.3.1. Data Tools Supporting Call Center Metrics

4.3.1.1. Automatic Call Distributor

The ACD is the central piece of technology used in a call center. It answers the call and distributes it either to the longest-idle agent or by some skill-based routing definition. It captures a variety of information about the calls, including blockage and delay times while waiting on a live answer, average handle time, hold times, after-call work, abandon rates, and more.

4.3.1.2. Workforce Management

A workforce management system uses historical data from the ACD to create call forecasts, calculate staffing requirements to meet service goals, and create staff schedules. Several reports are generated related to schedule efficiency, staff occupancy, adherence, and more.

4.3.1.3. Interactive Voice Response ("IVR")

This voice-processing technology provides an automated menu to callers to either complete a self-service transaction or to route a call as directed by menu choices. Reports are available showing use of menus, exit points, etc.

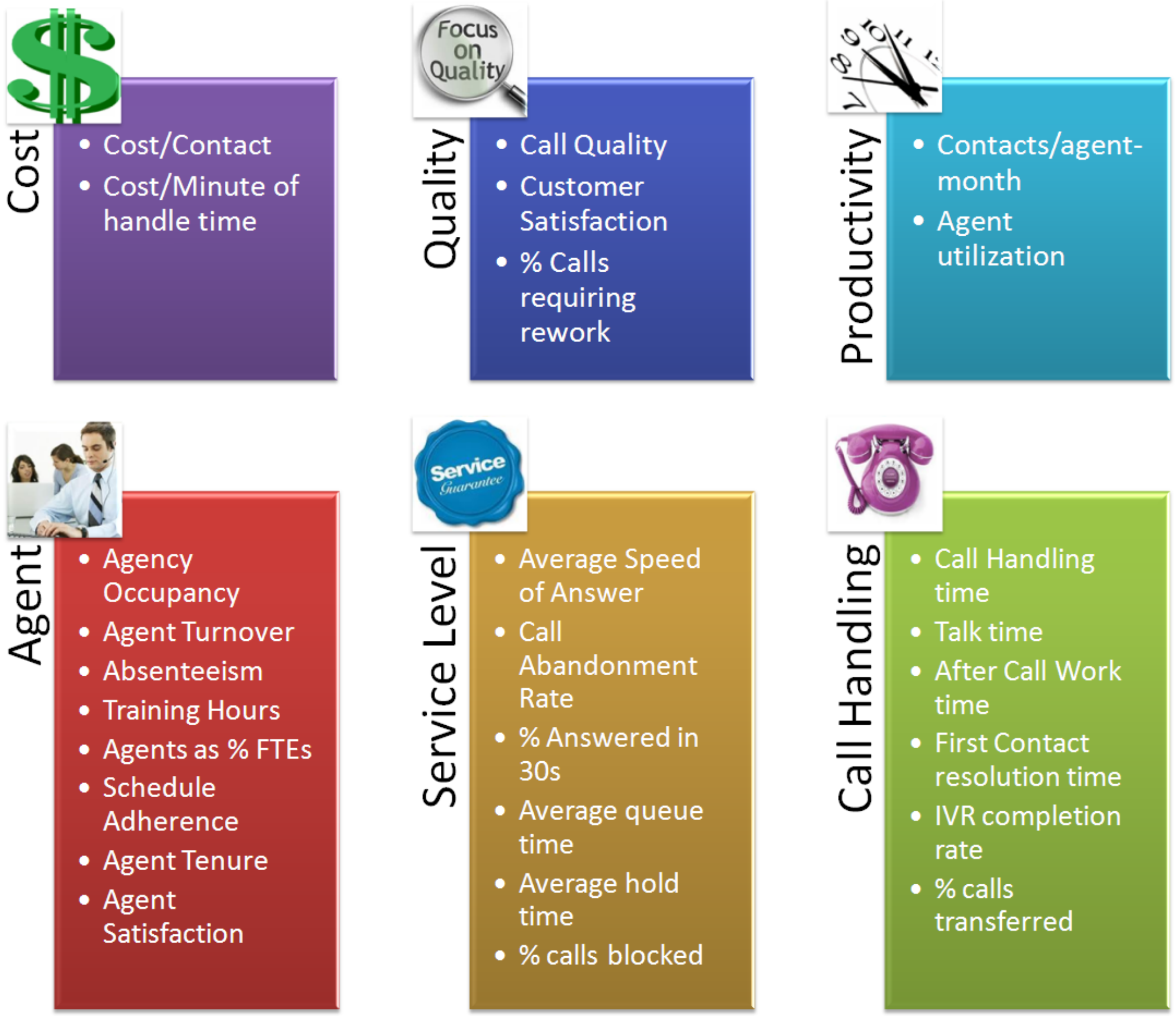
4.3.1.4. Customer Surveys

Every call center should perform its own surveys in order to understand the perceptions of callers related specifically to call center transactions. While a Call Center funder may conduct (or contract with an outside evaluator to conduct) regular caller satisfaction surveys, these surveys typically focus on products, support services, and a variety of other measures. To evaluate how effectively the call center is serving callers and representing the Call Center organization, the Department should consider conducting customer surveys solely focused on the call center experience.

4.3.2. The Value of Metrics

According to industry reports, the average customer service call center tracks more than 25 metrics. This is a classic example of quantity over quality, where call centers mistakenly assume that they are doing something productive and good by tracking all of these metrics. At a minimum, organizations should monitor the following metrics: cost per call; customer satisfaction; first contact resolution rate; agent utilization; and aggregate call center performance. Figure 4.3.2-1 presents a list of the most common performance indicators used in the industry.

Figure 4.3.2-1 Common Call Center Metrics



Cost
- Cost/Contact
- Cost/Minute of handle time

Quality
- Call Quality
- Customer Satisfaction
- % Calls requiring rework

Productivity
- Contacts/agent-month
- Agent utilization

Agent
- Agency Occupancy
- Agent Turnover
- Absenteeism
- Training Hours
- Agents as % FTEs
- Schedule Adherence
- Agent Tenure
- Agent Satisfaction

Service Level
- Average Speed of Answer
- Call Abandonment Rate
- % Answered in 30s
- Average queue time
- Average hold time
- % calls blocked

Call Handling
- Call Handling time
- Talk time
- After Call Work time
- First Contact resolution time
- IVR completion rate
- % calls transferred

These five metrics represent the 80/20 rule when it comes to call center performance: 80% of the value you receive from performance measurement and management in your call center can be derived from these five simple metrics. There is an adage in that says "*You can't manage what you don't measure*" and its counter argument, "*You get what you measure*." The point of these statements is that while monitoring performance is necessary in order to promote continuous improvement and manage staff, you need to carefully selection your performance metrics so that you motivate the desired behaviors. At present, the Department's Customer Service group has experienced significant changes including a large number of new people; new billing system; and frozen salary levels. As a result, Black & Veatch suggests that the Department suspend monitoring of metrics until personnel have been adequately training in the new processes. Measuring performance when people are not adequately trained or new to the process does not produce results that are representative of what the organization could achieve. Suspension of performance monitoring should be a short-term activity (for example, no more than 6 months).

4.3.3. Front-Line Staff Performance Measures

The following are Black & Veatch's recommendations for front-line staff performance measures that the Department could use to assess call center performance. Table 4.3.3-1 summarizes a balanced set of measures for frontline staff is critical and should include both quantitative metrics as well as some qualitative measures.

Table 4.3.3-1 Suggested Front-Line Staff Performance Measures

Performance Category	Performance Measures for Frontline Staff	Quantitative Measure	Qualitative Measure
Service	Schedule adherence	X	
Quality	First-call resolution rate Transfer rate Telephone etiquette Competency/knowledge Error/rework rate Process adherence	X X X	X X X X X X
Efficiency	Schedule adherence Availability AHT ACW time On-hold time Conversion rate	X X X X X X	X

The most common quantitative measures of performance are schedule adherence, availability, AHT, ACW, on-hold and transfer rates, and conversion rate. CSRs should also be evaluated on qualitative measures, including general telephone etiquette and communications skills, product and service knowledge, completeness of the call handling, and adherence to defined procedures and processes.

The qualitative measures track what an agent says or how the agent interacts with the customer. Some call centers want to know if the agent said the organization's name in the greeting; used the caller's name appropriately; used the correct tone, pitch, and volume; and closed the call appropriately.

Performance management begins with defining performance goals and expectations. There are many quantitative performance expectations (defined in the previous section), such as schedule adherence percentage, AHT, call transfer rate, conversion rate, and so on. Other expectations will be defined around qualitative goals, such as portrayal of positive image, display of active listening skills, and use of proper pacing and voice quality. Many of these need to be defined at a behavioral level for employees to fully understand what is expected and in order to measure their performance fairly and objectively.

Once these goals and expectations have been set, the next step is to gather information about actual performance versus desired performance to identify performance gaps and problems. There are many sources of quantitative data upon which to draw. Qualitative data will likely come from observation and monitoring.

Presented in Appendix A is additional information pertaining to the quality measurement process for customer service, as well as performance reporting.

4.4 METER REPAIR

Black & Veatch met with and interviewed employees from the Meter Repair section of the Customer Services Division. During the course of these interviews, Black & Veatch project team members performed multiple day facility tours at the Customer Services facilities. The following provides a discussion of the Division and Meter Repair section areas of responsibility, interview and data research findings, and related recommendations. Accurate metering of customer's water usage is an essential function for a water utility. The customer meters translate volumes of water to an amount of revenue. To evaluate the operational effectiveness of the Meter Repair section, we probed into the following areas:

- Organization – A review of the current organization of the Meter Repair operations component of Customer Services
- Staffing – An evaluation of staff levels, succession planning, workload, and outsourcing/contracting

4.4.1. Areas of Responsibility

Meter Repair performs the following functions:

- Installs, repairs, calibrates and tests water meters and related equipment by checking meters, sandblasting, disassembling, and repairing water meters
- Conducts field tests by meeting with customers, testing meters for accuracy, repairing and replacing parts as needed; takes corrective actions to restore meter functions and processes related paperwork
- Conducts meter tests and repairs fire hydrant meters

- Repairs and calibrates backflow equipment and components by testing and recording results
- Performs shop maintenance by maintaining interior and exterior of shop, removing waste from neutralizing tank, replacing filters, disposing of hazardous waste and maintaining equipment and tools.

4.4.2. Organization

This element comprised a review of the Customer Services Division organizational structure, spans of control, reporting relationships, and organizational changes in the recent past. The structure of the division in regards to Meter Repair has changed over the past several years. Meter Repair used to be included in the Water Maintenance Division; however, it was moved to the Customer Services Division. It was moved to the Customer Service Division, as it was believed to be more customer-related than maintenance-related. The Customer Service Division organization chart currently shows the Meter Repair section reporting to the division's Water Administrator.

4.4.2.1. Findings

- With Meter Repair reporting directly to the division Administrator, it has elevated and added emphasis to the meter repair function.

4.4.2.2. Recommendations

- At this time, this function should stay within the Customer Service Division despite staffing changes that will be discussed in the next section.

4.4.3. Staffing

Currently, there is four (4) staff assigned to this section consisting of:

- One (1) Water Services Supervisor
- One (1) Lead Water Meter Repair staff
- Two (2) Water Meter Repair staff

Through the interview process, we determined that all four Meter Repair personnel are reaching end of service on December 31, 2011. While we could not determine if the division has a documented staff succession plan for these end of service positions, we did find retirement spreadsheets that have been used to determine when staff would be needed to continue servicing customers through the Department's Meter Replacement Program ("MRP"). Further complicating this issue is the increasing volume of activity handled by this section. Due to the MRP, this section handles 600 to 800 replacements per week. There is a negative effect on workflow and backlog during furlough and personal leave events.

4.4.3.1. Findings

- This section is budgeted for 4 positions for meter repair.
- Backlog increases following furlough days and when one or more staff in this section takes personal leave.
- Volume from the MRP results in 600 to 800 replacements per week.

- All four current employees reach end of service on December 31, 2011.
- This Division lacks a succession plan to fill these future vacancies as well as transfer knowledge.
- The supervisor is a working supervisor.
- No dedicated administrative support for this section.
- Staff notes that there are instances where the MRP contractor has replaced new meters installed by the Department indicating possible duplication of effort.

4.4.3.2. Recommendations

- Due to workload demands, all four end of service retirements should be replaced.
- Succession plan should be developed to actively recruit experienced replacements or cross-train existing staff within the next four to six months where re-assignment is warranted.
- Add another position to Meter Repair for a total of five staff as this area falls behind frequently due to significant meter replacement activity and to compensate for staff personal leave time.
- Examine role and workflow of MRP contractor to reduce instances of duplicative effort.
- If warranted, assign a part-time role for dedicated administrative support.

5. Business Services Division Evaluation

The Business Services Division of the Department is the financial arm of the water utility. This division is responsible for accounting and financial reporting; establishing Department operational and capital budgets; developing rate increase and rate structure recommendations; and conducting management analyses supporting special projects. A total of 15 FTEs are budgeted for the division. As of July 14, 2011, there are three vacant positions and three EOS scheduled by December 31, 2011. Of particular concern to the City is that five of the vacancies / EOS positions are senior-level staff. For this reason, the City requested Black & Veatch examine and provide recommendations to help the Business Services Division over the short-term.

In developing the observations and recommendations below, Black & Veatch conducted interviews with all members of the Business Services Division; reviewed provided policies and procedures; and evaluated operational data.

5.1. WHAT THE DIVISION DOES WELL

Although the division's budget provides for 15 FTEs (including the Administrator), in reality, the division is performing essentially all its responsibilities and duties with only a staff of 12 people. Based on interviews with staff and field observations, Black & Veatch notes that the division is doing exceptionally well in the following areas:

- **Best-in-class tracking of assets.** The division has one staff member who is primarily in charge of tracking assets and entering completed CIP projects into the fixed asset register. The division's process for reconciling CIP expenditures to asset classes and installation date is well documented; followed closely; and very thorough. In Black & Veatch's opinion, the division's activity in this area is best-in-class. However, this functionality is impacted by a recent resignation and retirements.
- **Timely production of O&M and capital budgets.** The Department's process for generating the O&M and capital budgets requires considerable time and effort. Meeting the requirements of the Citizens' Water Advisory Committee ("CWAC") means that the division's staff must begin the budgeting process almost immediately after the beginning of the fiscal year. After approval from the CWAC, budgeting staff must then begin the process of entering the projections into the City's budgeting format. The division accomplishes all of this work with a minimal level of staff (six).
- **Detailed development of rates and charges.** Tracking the development of budgets is another labor-intensive process of updating the Department's rate model and rate schedule. The division's practice is to complete a full cost-of-service study annually (complete with detailed cost allocations of O&M and capital expenditures using data from the Department's full activity-based costing ("ABC") details). An external rate consultant reviews the division's model and recommendations, and then staff presents the proposed rate increases and modifications to the rate schedule to the CWAC. Once approval is received from the CWAC, the proposed increases are then presented to City Council. The division's process for producing new rate adjustments is long, but because of the number of vetting stages, it does provide the

public with some level of re-assurance that the process is transparent and increases are justified.

- **Excellent job of maintaining financial creditability with credit markets.** Over the last few years, the bonding agencies and financial markets have tightened requirements for all borrowers. The division has stepped up its presentations to the rating agencies and presented comprehensive plans that focus not just on the financial condition of the utility, but illustrates the Department's understanding that water resource strategies affect rates and consumptive behavior. Despite difficult times, the Department has a solid bond rating and this is a direct reflection of the division's efforts to manage this aspect of the business.

5.2. AREAS FOR IMPROVEMENT / EFFICIENCY GAINS

Given the situation facing the division over the immediate short-term, Black & Veatch provides the following recommendations to help balance workloads while maintaining high levels of service.

- The division has budgeted positions for a financial manager and three management coordinators. The City's definition for a management coordinator requires a certain level of direct reports and duties. While the level of duties and responsibilities may not meet the City's definition for "management coordinator", Black & Veatch suggests that the Department work with the City's Human Resources Department to create a new job classification that more closely matches staffs' duties and responsibilities.
- Black & Veatch recommends that the division hire a person to fill the currently vacant Accounting & Reporting position. This position does not necessarily need to be filled by a management coordinator. Over the last year, the division has not been able to provide Department-level financial statements, as well as perform other analytical financial/budgetary work. Additionally, feedback from other managers indicate that revising the monthly management reports to include additional information would be a benefit to all. One of the functions of financial group is to provide information to managers so that timely and informed decisions can be made. Lack of resources in this area is hampering the division's ability to provide this necessary service.
- The division should consider using any potential cost savings from the above two recommendations to fund a staff administrative level position dedicated to overseeing procurement activities. The increased use of P-cards warrants having someone dedicated to reviewing P-card expenditures and reviewing conformance with City policies.
- Move this division from reporting to the Director to the Deputy Director of Customers (mid to long term).
- Increase training of administrative staff in remote locations (at the plant sites for example) to reduce duplication of effort back in Finance. Lack of training, or

improperly assigning tasks to people is resulting a significant amount of rework being done by the Finance staff.

- Black & Veatch recognizes that the division and Department spend a considerable amount of time on the the rate process. As noted earlier, these processes are thorough and comprehensive. In light of the upcoming vacancies due to EOS retirements and the long lead time in finding qualified staff, Black & Veatch suggests that the Department consider the following:
    - Adopting rate increases that are effective for 2-year cycles. This is not an uncommon practice throughout the nation, and in some areas of the country, 5-year rates are adopted. The adoption of bi-annual rates does not mean that the financial condition is not examined annually – this should occur as a normal course of business during budget season. However, time, labor and outside consultant savings are realized in adopting multi-year rate increases.
    - Evaluate the benefit of conducting a full cost-of-service study annually. The functional cost components that form the basis for cost allocation in a cost of service study do not necessarily change significantly from year to year. Generally, if there is a large new addition/change to the system, or major changes in demographics or customer base (e.g., large industry leaves), then conducting a review of the cost allocation percentages is warranted. To save time and money, the division could use an average for cost allocations in the populating the cost-of-service model. Gathering the necessary details to update the rate model is very time consuming and may not provide a commensurate benefit.

6. Benchmarking

Benchmarking has emerged as a highly useful tool that enables managers in all public and private sectors to evaluate institutional performance, and to make management decisions for improvement based on best practices, both within industries and across industry lines. As such, it has become a critical component in the management strategy of recognized well operated utilities to not only define the right thing for an organization to do (being effective), but also to do it right (improving efficiency and productivity), resulting in visibly improved effectiveness and engendering customer support and satisfaction. Benchmarking involves two key processes:

- The first is a systematic search for the best practices, innovative ideas, and strong operating procedures (both within the subject industry and, as appropriate, within other highly ranked organizations) all of which contribute to superior performance.
- The second is an evaluation, adoption (or adaptation), and implementation of practices, ideas, and procedures so that organizational performance can be improved. Although not a "formal" component of benchmarking, an ancillary element is the continuing quality analysis and process modification.

The private sector uses benchmarking as an essential element in maintaining a competitive status in the marketplace. This framework for benchmarking does not apply to the public sector; competition for provision of services is not a requirement for government survival. Consequently, governmental agencies have moved to reevaluate their services in the face of reduced resources, increased service demands, and public demands for cost-efficient services that meet community needs. As a result, more governmental agencies have assessed their practices against those practices which are "best in industry" and against those agencies which are considered "best in class".

Benchmarking provides several critical assessment points. First, it uses performance measures to identify low performance areas. Secondly, it looks both within and outside its "industry" to determine where the best practices lie, then adapts those practices to the institution. Third, it integrates continuation of the process into the process itself. Other tools include evaluating poorly performing areas and analyzing their shortcomings by extensively assessing both the "how" and the "why" of work processes. Within the utility sector, several activities are elements of effective benchmarking, including customer service levels, customer satisfaction, cost management, improved revenues, high product quality, high workmanship quality, and staffing and equipment levels. While each utility differs from others (and each community's values influence), many of these attributes of targeted benchmarks can help the utility accomplish the following: (1) significantly, and positively, affect the utility's strategic vision; (2) offer concrete performance improvement goals; (3) assist the utility in identifying resource requirements; (4) educate policymakers and community leaders; and (5) build credibility within the communities they serve. As a component of this efficiency analysis, Department and its consultants defined areas to be benchmarked for its operations.

All benchmarking efforts have inherent difficulties. Each utility faces unique circumstances of climate, governance, water supply and other related utility elements. This caveat notwithstanding, benchmarking has two potentially useful functions. It can measure a utility's performance over time, by benchmarking against itself. Resolution of definition and measurement difficulties will make this possible in future years. With appropriate precautions, a utility can also benchmark against the industry as a whole.

The reader is cautioned about taking one specific performance metric as an indication of good overall performance. The inverse applies as well. Differences in attributes and drivers between individual utilities make comparisons more difficult. In using benchmarks to monitor performance, Black & Veatch notes that there are difficulties comparing utilities to one another due to unique regional conditions. Some of the local issues that may contribute to "lower" benchmarking for the Tucson Water Department include:

- A very large service area, which requires more facilities to distribute the water; and
- Power cost differentials – both price and usage - are unique to each utility's location. So also are a wide range of political, regulatory, hydrological, and economic differences between utilities.

When possible, it is more appropriate to make benchmark metric comparisons between utility operations for similar population levels and within the same region. It is also more appropriate to look at the trend of specific metrics over time, if possible, so that variables can be controlled and held somewhat constant. Long-term, consistent performance data can be an important resource in benchmarking evaluation.

6.1. COMPARATIVE UTILITIES

Given the various uncertainties associated with measurement and variation across utilities, it is makes little sense to seek precise comparisons. Hence, Department's score is shown relative to various ranges and quartiles of surveyed data (American Water Works Association benchmarking data) as well as several water agencies across the United States, similar to Department in customer account size. To conduct the benchmarking for Department, we relied on results from the American Water Works Association's (AWWA) "Benchmarking: Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report", an industry standard. The AWWA report breaks out results by regions (Northeast, South, Midwest, West, Canadian provinces, and International), by utility size (population served: > 500,000, 100,001 to 500,000, 50,001 to 100,000, 10,000 to 50,000, and < 10,000), and by utility service or operation type (water operations, wastewater operations, combined operations).

Arizona is included the West region and according to the City of Tucson website, the City's 2011 population is slightly over 1,000,000. The 2007 AWWA benchmarking report had 180 utility participants, with 49 participants from the West region and 60 of the utilities in the Water category. Specific performance indicators are presented in this section with data provided in the 2007 AWWA benchmarking report, however this data is inflated to reflect current cost factors. We adjusted the survey cost data using the average annual percentage changes in the U.S. Bureau of Labor Statistics (BLS) Consumer Price Index (All Urban Customers). The time period we use for this cost adjustment is Fiscal Year 2006/2007 (the fiscal year the AWWA survey data was collected) to 2010 (the last complete year for BLS CPI data). We also included past Department data based on the QualServe Benchmarking Indicators report. This report includes data on 20 performance indicators from FY 2002 through FY 2009. The analysis will demonstrate the movement of performance indicators over the past 9 fiscal years for Department.

For this analysis, we compare Department's indicators to three survey groups: West Region agencies, agencies that provide water service to populations over 500,000, and to several individual agencies similar in customer account size to Department. The individual data was gathered using Black & Veatch resources and is not considered part of the AWWA surveyed data.

The most current industry benchmarking data available is the *2006 Benchmarking: Performance Indicators for Water and Wastewater Utilities* by AWWA (Benchmarking survey). The Benchmarking survey tracked the performance of 350 water and wastewater agencies over four years. AWWA has tentatively scheduled the next update to this survey for 2012.

6.2. BENCHMARKING INDICATORS

This section provides definitions for the various terms used in the AWWA and Qualserve benchmarking surveys. The list of indicators is not comprehensive and in fact, the Department notes that it has not responded to water treatment questions posed by AWWA, Qualserve or AWWArF because the questions are specific for operation of a treatment plant.

6.2.1 Water Operations & Maintenance Cost Ratios:

- **O&M Costs/Account** – This indicator is defined by the following calculation [Total O&M costs (less non-cash expenses) ÷ Total number of active customer accounts]
- **O&M Costs/MG processed** – This indicator is defined by the following calculations[Total O&M costs (less non-cash expenses) ÷ Volume distributed during an annual period (in MG)]
- **Drinking Water Compliance Rate** – This indicator is defined by the following calculation 100* [Number of days in full compliance] ÷ 365 days
- **Planned Maintenance Ratio in percent [hours]** - This indicator is defined by the following calculation – [(100) Hours of Planned Maintenance ÷ (Hours of Planned + Corrective Maintenance)]

6.2.2 Customer Relations

- **Customer Service Complaints** – This indicator is defined by the following calculation [(Service related complaints) ÷ Total number of active customer accounts] * 1000
- **Disruption of Water Service – Planned (4 to 12 hours)** – This indicator is defined by the following calculation [(Number of customers experiencing disruption) ÷ Total number of active customer accounts] * 1000
- **Disruption of Water Service – Unplanned (<4hours)** – This indicator is defined by the following calculation [(Number of customers experiencing disruption) ÷ Total number of active customer accounts] * 1000

6.2.3 Organizational Development

- **Training Hours per Employee:** A measure of the formal training utility employees receive in a given year is expressed as the number of formal training hours per employee per year. It is intended to reflect the organization's commitment to formal training as a means of improving employee knowledge and skills. Over time, a commitment to employee training improves productivity and effectiveness/efficiency.

- **Customer Accounts per Employee:** This indicator is intended to measure employee efficiency and calculated as [number of active customer accounts ÷ Number of full-time equivalent employees of the organization]
- **MGD Water Delivered per Employee:** This indicator is intended to measure employee efficiency and calculated as [average MGD processed ÷ Number of full-time equivalent of actual facility O&M employees]
- **Best Practice Index:** The Best Practice Index consists of several activities that “good” utilities practice. We note that the rating provided on these activities is “self-assessed”. The activities, which also are part of the EUM framework, are Strategic Planning, Long-Term Financial Planning, Risk Management Planning, Optimized Asset Management, Performance Management, Customer Involvement, and Continuous Improvement.

6.3 OPERATIONAL BENCHMARKING RESULTS

6.3.1 Comparison with AWWA Survey Data: West Region Water Utilities

Each performance indicator for the West region, which pertains to Department, is presented in Table 6.3.1-1.

Table 6.3.1-1 Performance Indicators – West Region Comparison

Performance Indicator	Tucson Water (FY 02)	Tucson Water (FY 09)	Tucson Water (current)	Top Quartile	Median	Bottom Quartile
O&M Expense (less non-cash expenses)/Account	$319	$352	$474	$272	$366	$478
O&M Expense (less non-cash expenses)/MG Distributed	$1,466	$2,106	$2,829	$1,256	$1,736	$2,709
% Planned Maintenance Ratio (hours)	No Data	67.4%	36.0%	84.2%	70.0%	40.7%
Drinking Water Compliance Rate	99%	100%	100%	100%	100%	100%
Customer Service Complaints	13.5	6.3	TBD	0.7	2.0	8.5
Disruption of Water Service (Planned) - 4 to 12 hours	No Data	0.0	TBD	0.0	0.6	2.0
Disruption of Water Service (Unplanned) - < 4 hours	No Data	38.0	TBD	1.3	2.7	6.7
Training Hours per Employee (annual)	27.0	15.0	15.0	34.8	28.6	13.7
Customer Accounts per Employee	359	437	408	605	460	386
MGD Water Delivered per Employee	0.21	0.20	0.19	0.24	0.16	0.13
Organizational Best Practices Index	24	35	TBD	28	24	22

* Average Annual Change CPI (All Urban Customer) – 2007: 2.80%; 2008: 3.80%, 2009: (0.40%), 2010: 1.60%

The trends noted above indicate that the Department is performing well compared to its Western Region peers in the areas of Drinking Water Compliance (top quartile) and MGD Water Delivered per Employee (moving towards the top quartile). Although the benchmarking comparison would seem to indicate that the Department has significant room to improve regarding its O&M expense ratios (bottom quartiles), it should be noted that the FY 09 and current year figures reflect increasing CAP water purchases to maintain the City's full water allocation rights. For other agencies, O&M costs may not reflect this proactive water resource management. For benchmark indicators where data is available, it is clear that the economic conditions and EOS have impacted the Department's ability to provide planned maintenance activities (bottom quartile). With respect to training activities, the survey does not provide a detailed breakdown of training hours by operational area (maintenance, admin, etc.), but clearly the trend is that the Department is trimming hours in this category. Black & Veatch anticipates that training hours will increase with the implementation of the SCADA master plan and other technology programs.

As of the writing of this report, the Department is still compiling survey data for the number of customer complaints and service disruptions. Black & Veatch anticipates that the Department will not be in the top quartile for complaints – as discussed under the Customer Service section and expects that the Department will be in the middle to bottom quartile for disruptions due to resource (capital and human) limitations.

Finally, with respect to the self-assessed organizational best practices index: While it is true that the Department has programs in place to address all seven elements, Black & Veatch notes that the Department excels in the following areas: long-term financial planning, performance measurement, continuous improvement, and customer involvement. In the area of asset management, the Department is implementing the Maintenance Management program.

In the past, the Department did engage in strategic planning, and the latest version of the TW Business Plan reflects many of the EUM framework elements and best management practices in this area. However, the Department has not updated or revisited the strategic plan lately and this is in part due to the lack of a permanent Director.

At a minimum, Black & Veatch suggests that the Department engage in a best management practice of updating the strategic plan on a bi-annual basis. Black & Veatch suggests that the Department provide routine updates on progress made against the 2007 Business Plan activities and further, commit to engaging in strategic planning activities on a bi-annual basis. Moreover, Black & Veatch suggests that the Department adopt an implementation plan and schedule to help guide its strategic activities. Some specific recommendations that the Department should include as part of its process include the following key elements:

- Begin the strategic review with a formal evaluation of the plan's status to-date.
- Identify and revise, as necessary, the list of critical success factors and strategic initiatives. Strategic initiatives should support critical success factors.
- Assign a champion for each critical success factor. It is the responsibility of each champion to assemble a team to help implement the assigned critical success factor.
- Tie the Strategic Plan to the long-range financial plan for the Department.
- Develop and report on performance measures that address the ten attributes of an effectively managed utility as outlined in the EUM:
    - Product quality;

  - Customer satisfaction;
  - Employee and leadership development;
  - Operational optimization;
  - Financial viability;
  - Infrastructure viability;
  - Operational resilience (i.e., risk management, safety, emergency preparedness);
  - Community sustainability;
  - Water resource adequacy; and
  - Stakeholder understanding and support.

- Report on a monthly basis the status of each strategy within a strategic initiative.
- Define a clear planning schedule with deadlines.
- Communicate the final strategic plan to all stakeholders.

Finally, although succession planning is not a list characteristic under organizational best practices as defined by AWWA, the EOS Program has highlighted the lack of succession planning in the Department. Black & Veatch recommends that as part of the annual employee performance review, all personnel with supervisory duties should identify people with the potential to fill their position. In addition, the Department should develop a management / leadership program to help train personnel in such areas as project management, communication, leading and mentoring, etc. The Department's succession plan should be reviewed annually.

6.3.2 Comparison with AWWA Survey Data: Water Utilities Serving Populations Greater Than 500,000

Each performance indicator for agencies providing water service to population over 500,000, which pertains to the Department, is presented in Table 6.3.2-1.

Table 6.3.2-1 Performance Indicators – Large Utilities (Population >500,000) Comparison

Performance Indicator	Tucson Water (FY 02)	Tucson Water (FY 09)	Tucson Water (current)	Top Quartile	Median	Bottom Quartile
O&M Expense (less non-cash expenses)/Account	$319	$352	$474	$176	$252	$344
O&M Expense (less non-cash expenses)/MG Distributed	$1,466	$2,106	$2,829	$956	$1,425	$1,798
% Planned Maintenance Ratio (hours)	No Data	67.4%	36.0%	60.1%	51.1%	21.4%
Drinking Water Compliance Rate	99%	100%	100%	100%	100%	100%
Customer Service Complaints	13.5	6.3	TBD	0.9	3.8	19.7
Disruption of Water Service (Planned) - 4 to 12 hours	No Data	0.0	TBD	0.21	0.41	1.2
Disruption of Water Service (Unplanned) - < 4 hours	No Data	38.0	TBD	0.83	2.62	8.44
Training Hours per Employee (annual)	27.0	15.0	15.0	31.8	24.5	16.4
Customer Accounts per Employee	359	437	408	674	508	369
MGD Water Delivered per Employee	0.21	0.20	0.19	0.52	0.30	0.240
Organizational Best Practices Index	24	35	TBD	27.5	24	21

* Average Annual Change CPI (All Urban Customer) – 2007: 2.80%; 2008: 3.80%, 2009: (0.40%), 2010: 1.60%

When compared to utilities providing services to populations over 500,000, the Department compares well in the area of Drinking Water Compliance (top quartile). It would appear that with this peer group, the other utilities have more opportunities to leverage economies of scale as compared to the Department. In addition to some of the unique service issues already mentioned in this Report, it is still apparent that the Department has room to improve in the areas of training, customer accounts and water delivered. In comparison to this peer group, the Department is moving towards the median with respect to planned maintenance.

Similar to that noted above, as of the writing of this report, the Department is still compiling survey data for the number of customer complaints and service disruptions. Black & Veatch anticipates that the Department will not be in the top quartile for complaints – as discussed under the Customer Service section and expects that the Department will be in the middle to bottom quartile for disruptions due to resource (capital and human) limitations.

6.3.3 Comparison with Agencies participating in Qualserv

In addition to the AWWA benchmarking study, Black & Veatch has also reviewed the Department's performance against Qualserve data. This industry benchmarking study began in 2002. It was repeated for 2003-2006, re-introduced in 2009, and continues to date. The Department has participated in each iteration of the survey and collected data for the missing years 2007-2008 to ensure continuity. The Department will submit the data for FY10 by the end of September. Table 6.3.3-1 summarizes the data used in this report provided below shows the complete time-period. All financial measures are expressed in 2009 dollars to account for inflation.

When compared to the Qualserv peer group, the Department compares well in the areas of Drinking Water Compliance (top quartile) and training hours (moving towards top quartile). The trend for the other indicators are similar to the comparison for other peer groups, with the exception of O&M expense per MG, where the Department is moving towards the median.

Table 6.3.3-1 Performance Indicators – All Water-Only Utilities Reporting in the AWWA Qualserve Benchmarking Survey Comparison

Performance Indicator	FY02	FY03	FY05	FY06	FY07	FY08	FY09
O&M Expenses Per Account in 2009 Dollars							
Tucson Water	$382	$495	$377	$381	$370	$370	$352
Top Quartile	$199	$249	$230	$218	-	-	$184
Median	$293	$341	$298	$289	-	-	$256
Bottom Quartile	$386	$607	$464	$380	-	-	$279
O&M Expenses Per MG in 2009 Dollars							
Tucson Water	$1,758	$2,412	$2,008	$2,074	$2,138	$2,096	$2,106
Top Quartile	$1,036	$997	$1,120	$1,102	-	-	$1,026
Median	$1,132	$1,677	$1,504	$1,601	-	-	$1,848
Bottom Quartile	$1,758	$2,443	$2,469	$2,456	-	-	$2,567
Percent Planned Maintenance							
Tucson Water	-	-	48%	72%	57%	67%	67%
Top Quartile	78%	83%	83%	74%	-	-	78%
Median	62%	64%	67%	62%	-	-	64%
Bottom Quartile	42%	43%	41%	46%	-	-	53%
Drinking Water Compliance Rate							
Tucson Water	99%	97%	100%	100%	100%	100%	100%
Top Quartile	100%	100%	100%	100%	-	-	100%
Median	100%	100%	100%	100%	-	-	100%
Bottom Quartile	100%	100%	100%	100%	-	-	100%
Training Hours Per Employee (annual)							
Tucson Water	27.2	20.1	31.4	27.1	15.84	7.05	14.9
Top Quartile	32.9	32.5	33.8	23.9	-	-	29.4
Median	27.2	20.1	19.5	15.5	-	-	19.6
Bottom Quartile	15.7	12.1	11.1	12.1	-	-	11.8
Customer Accounts per Employee							
Tucson Water	359	367	380	386	394	390	437
Top Quartile	643	592	621	667	-	-	756
Median	419	386	407	456	-	-	516
Bottom Quartile	216	260	331	333	-	-	355
MGD Water Delivered per Employee							
Tucson Water	0.21	0.21	0.19	0.19	0.19	0.19	0.20
Top Quartile	0.46	0.46	0.35	0.33	-	-	0.39
Median	0.31	0.28	0.24	0.24	-	-	0.21
Bottom Quartile	0.21	0.19	0.17	0.15	-	-	0.16

6.3.4 Comparison With Individual Water Agencies

In addition to comparing the Department performance indicators to compiled survey data, we also compare its indicators to a few agencies in Arizona as well as some agencies in other parts of the country. Most of the agencies represented in this analysis have large customer bases similar in size to Department. The comparative analyses are listed below in Figures 6.3.4-1 through.6.3.4-4.

Figure 6.3.4-1 O&M Expense (less non-cash expenses) per Customer Account

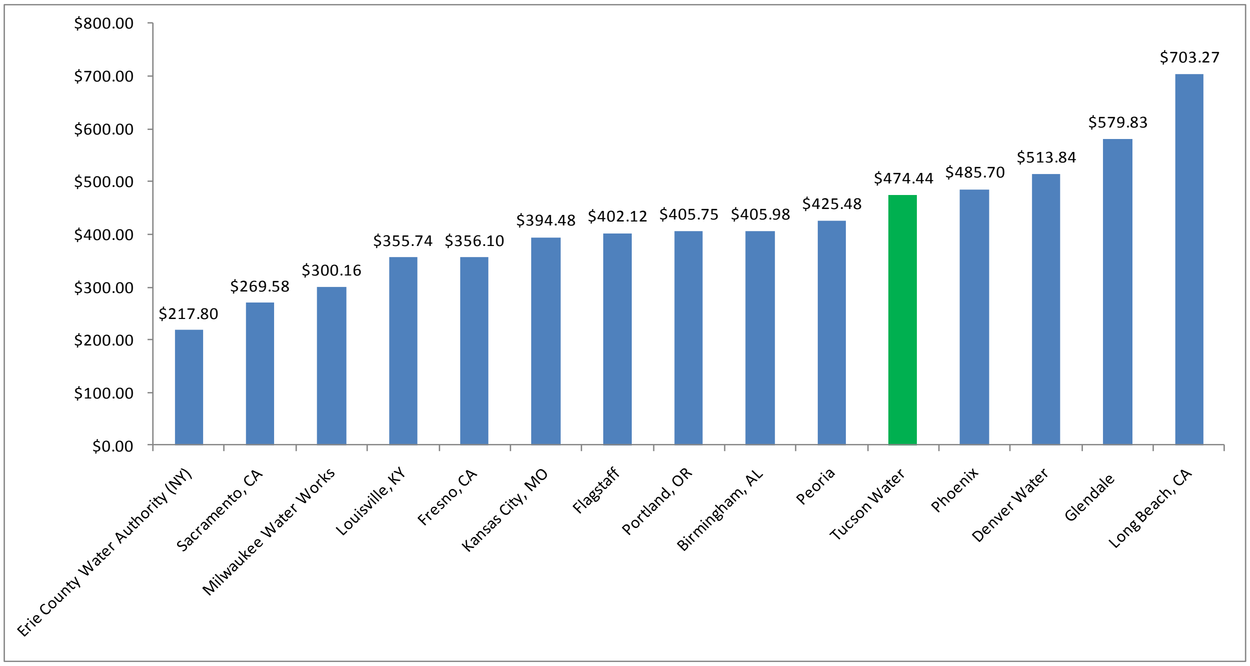


Figure 6.3.4-2 O&M Expense (less non-cash expenses) per Million Gallons Output

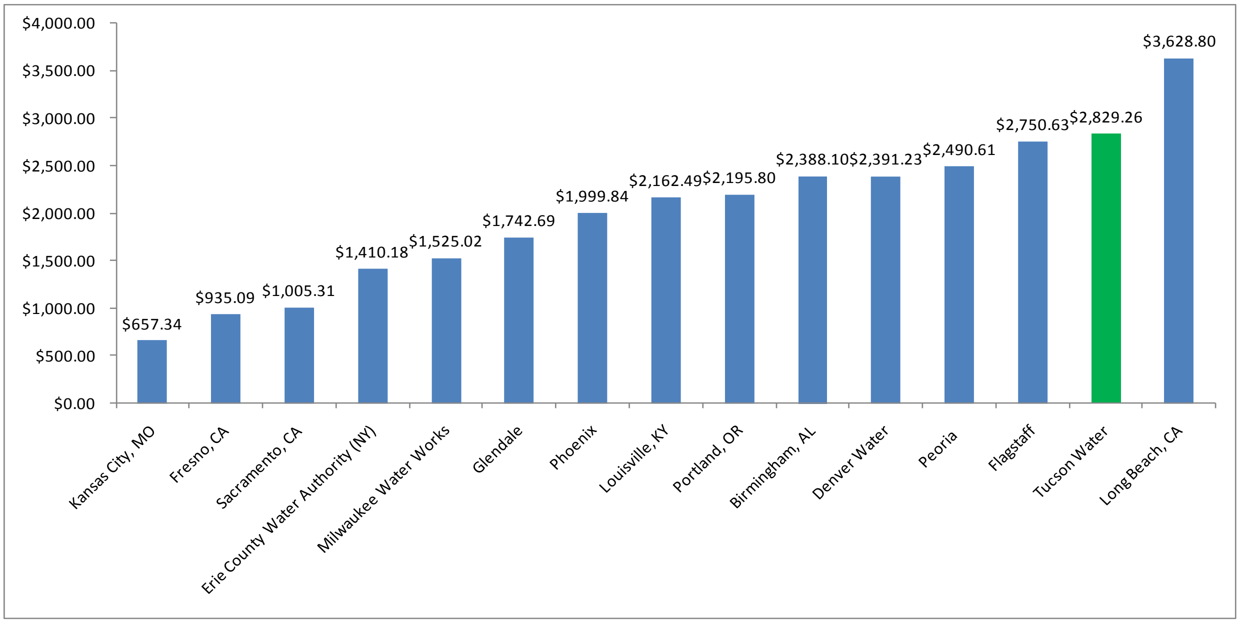


Figure 6.3.4-3 Customer Accounts per Water Department Employee

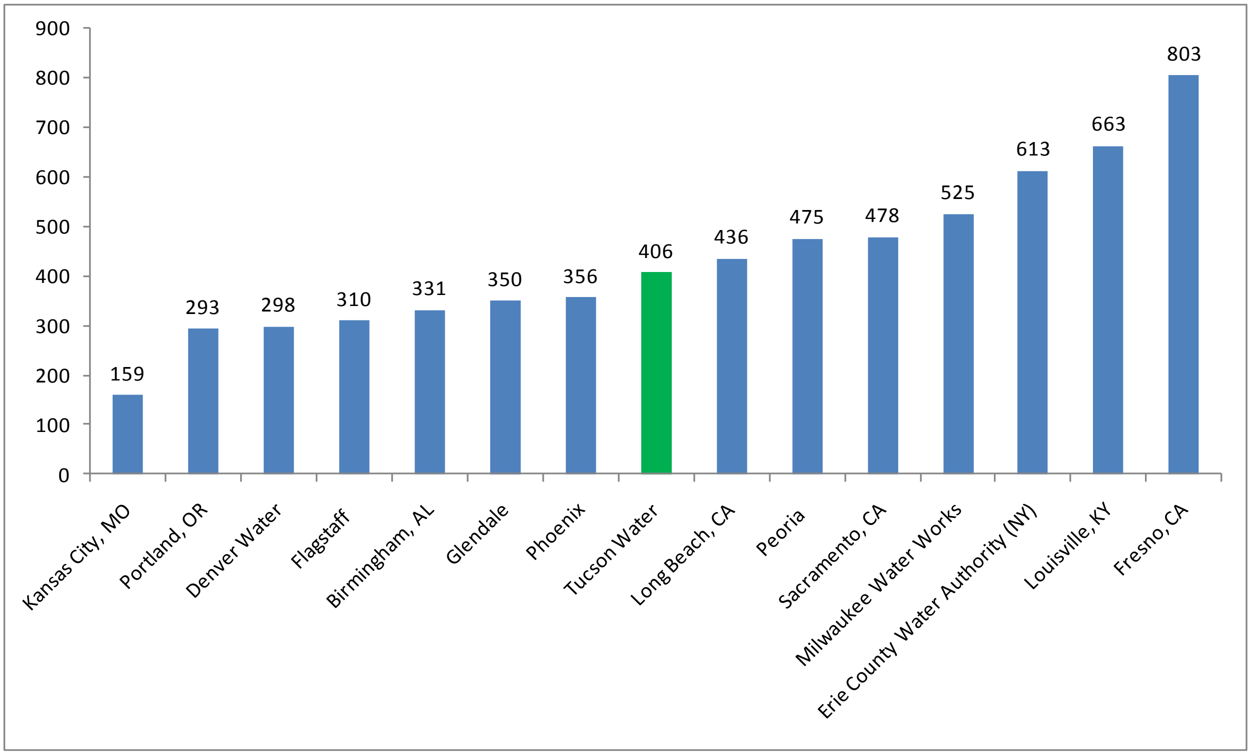
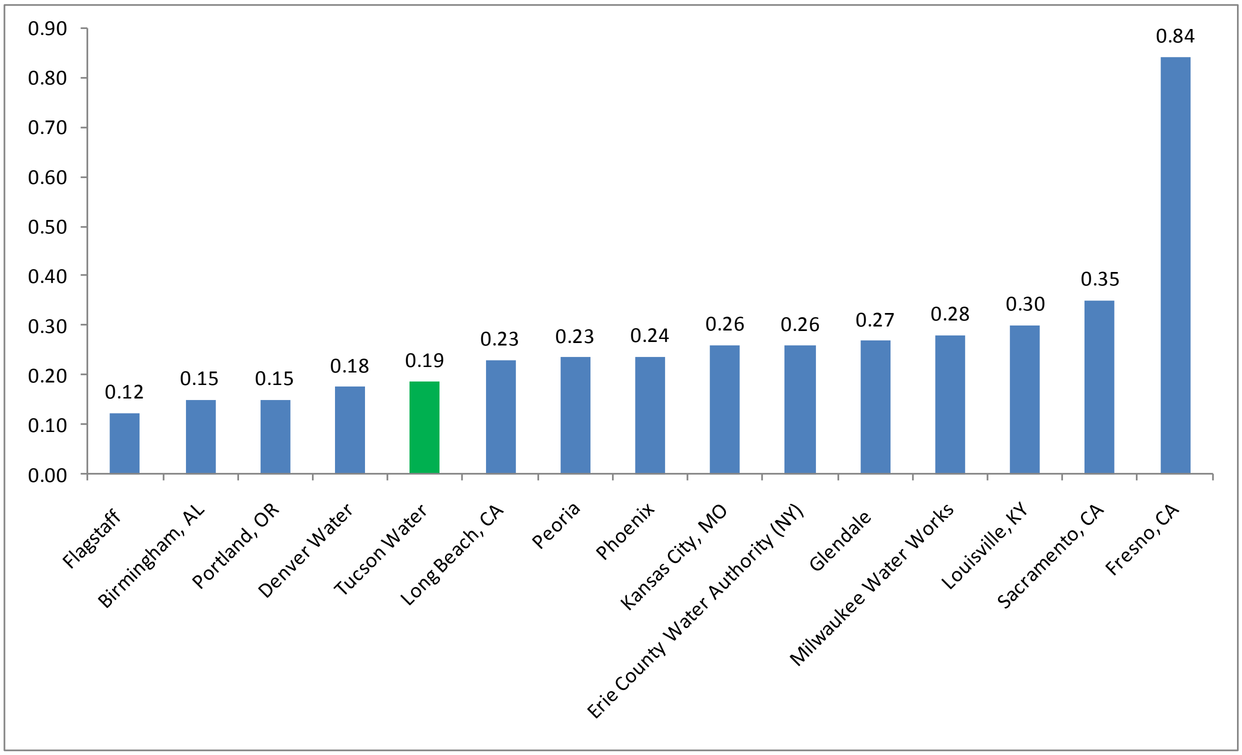


Figure 6.3.4-4 MGD Water Delivered per Employee



6.4 STAFFING AND ORGANIZATIONAL BENCHMARKS AND BEST PRACTICES

6.4.1 Staffing

One of the most often misunderstood benchmarks is the number of customer accounts per account metric. This particular metric is sometimes used to justify over/under staffing at an organization. In Black & Veatch's opinion, interviews with staff and our observations suggest that the Department employs competent people who are capable of carrying out their assigned tasks. A review of the Department's organizational charts and a comparison to the AWWA Benchmarking data indicates that TW's staffing level varies from the bottom quartile (Western peer group and Large Utilities) to the median quartile (Qualserv group). This finding simply indicates that the overall number of positions for the Department may be sufficient to meet the Department's goals, but individual divisions and / or units may be over- or understaffed.

The Department reports a figure of 408 customer accounts per employee. This statistic is between the median and bottom quartiles, and suggests that just using the benchmarking data, the Department should target the number of employees to hit the median benchmark:

- AWWA Western Region: 225,623 accounts / [460 accounts / employee] = 490 employees
- AWWA Large Utilities: 225,623 accounts / [508 accounts / employee] = 441 employees
- Qualserve: 225,623 accounts / [516 accounts / employee] = 437 employees

Based on just benchmarking measures, the results would imply that since the Department currently has 553 FTEs, it should targeting somewhere between 437 and 490 FTEs to achieve a median rating. As noted above, Black & Veatch **does not** recommend using benchmarking data alone for management decision-making.

6.4.2 Organizational Structure Best Practices

There is no one organizational structure that reflects best practice for the utility industry. That said, there are a number of characteristics that are consistent throughout the better run utilities in the public sector. The most prominent characteristic consistently demonstrated by best in class is that of leadership/reporting/accountability.

Utilities that are structured with all functions and/or products reporting to a point source demonstrate cultures and operations which support the mission, vision and common goals of the organization. Other structural characteristics that are present in best in class utilities are the focus on customer service, the recognition of core functions, and the need to provide appropriate support services.

For comparison purposes, the organizational structures of utilities that were recognized by the industry as exhibiting Best Practices were identified and compared to the Department's structure. The Association of Metropolitan Water Agencies (AMWA) annually presents Awards for

Utility Excellence. The competition requires a comprehensive review and presentation of each utility's operations. Award winners in 2010 include:

Platinum Awards for Utility Excellence	Gold Awards for Utility Excellence
Austin Water Utility	Anaheim Public Utilities
City of Bellevue Utilities	Louisville Water Company
City of Boca Raton Utility Services	Palm Bay Utility Company
El Paso Water Utility	San Antonio Water System
City of Glendale Utilities	San Diego County Water Authority
Department of Utility Services, City of Henderson	Western Virginia Water Authority
Newport News Waterworks	

Of the 13 utilities identified, nine operate as a Department within a City. Of those nine, seven have customer care services provided within the Utility structure, with the entities' director responsible for both customer and asset management activities.

Additional organizational or structural characteristics common to these award winning utilities is illustrated in the following table along with the Department's characteristics.

	Utility City Department	Customer Care Reports to Utility	Engineering Reports to Utility	Support Services			
				Procurement	HR	Fleet Services	IT
City of Tucson Water Department	**Yes**	**Yes**	**Yes**	**Centralized**	**Centralized**	**Centralized**	**Centralized**
Austin Water Utility	Yes	Yes	Yes	Centralized	Centralized	Centralized	Centralized
City of Bellevue Utilities	Yes	Yes	NA	Centralized	Centralized	Centralized	Centralized
City of Boca Raton Utility Services	Yes	Yes	NA	Centralized	Centralized	Centralized	Centralized
El Paso Water Utility	Yes	No	Yes	Centralized	Centralized	Centralized	Centralized
City of Glendale Utilities	Yes	No	No	Centralized	Centralized	Centralized - Public Works	Centralized
Department of Utility Services, City of Henderson	Yes	Yes	Yes	Centralized	Centralized	Centralized	Centralized
Newport News Waterworks	NA	NA	NA	Centralized	Centralized	Centralized	Centralized
Anaheim Public Utilities	Yes	Yes	Yes	Centralized	Centralized	Utility	Centralized
Louisville Water Company	No	Yes	Yes	Centralized	Centralized	Centralized	Centralized
Palm Bay Utility Company	Yes	Yes	Yes	Utility	Utility	Utility	Utility
San Antonio Water System	No	Yes	Yes	Centralized	Centralized	Centralized	Centralized
San Diego County Water Authority	No	Yes	Yes	Centralized	Centralized	Utility	Centralized
Western Virginia Water Authority	No	Yes	Yes	Centralized	Centralized	Centralized	Centralized

NA = Not available

Review of best in class utility structural characteristics reinforces core services of asset management (operations) and customer care structured in a single entity or department. Support services can be centralized to provide efficiencies, but further review of best in class utilities identifies a structure with a champion within the utility that is responsible for coordination between central services and the utility.

The key to successful support services is recognition of who the customer is and who provides the service. Finally, because engineering is a key support function to an asset intensive business like utilities, the best in class entities assign the engineering function to the utility structure, providing for closer coordination of prioritization of reinvestment in the assets.

Using these characteristics, the Department's centralized/decentralized areas follow best in class practices. As noted previously, in some areas, the ability to maintain negotiated levels of service for centralized functions depends on the presence of champions within the utility, as well as established policies and procedures. For some of the agencies listed above, direct hire of individuals with specialized skills (eg., GIS or SCADA) occurs or else may be contracted out.

Appendix A – Customer Service Quality Measurement and Performance Reporting

THE QUALITY MEASUREMENT PROCESS

Measuring how well frontline staffers meet qualitative standards is typically done through a quality-monitoring process. Some call centers want to know if the agent said the organization's name in the greeting; used the caller's name appropriately; used the correct tone, pitch, and volume; and closed the call appropriately. Each of these items can be observed by using a manual or automated process with a quality-monitoring form.

Call Monitoring

Monitoring may be done with side-by-side observation, remote monitoring of both telephone calls and screen activities, and recorded monitoring.

Side-by-Side Monitoring

Side-by-side monitoring involves simply sitting next to the employee and listening to how the call is handled. The best way to accomplish this task, with minimal disruption to other agents, is to "double-jack" into the agent's telephone set. A double-jack refers to the agent's telephone set having dual headset connections that enable the agent and observer to connect directly into the same telephone set using separate headsets. The observer's headset will be in mute mode to enable hearing but not speaking.

The advantage of this approach is that the observer is at the agent's side for "on the spot" coaching and guidance. The biggest disadvantage of using side-by-side monitoring is the potential for CSRs to be nervous when they are observed in very close proximity. Some CSRs are more comfortable without someone "watching over their shoulder," so the side-by-side monitoring procedure should be combined with one or more different monitoring procedures.

Silent Monitoring

Silent monitoring allows an observer to access a call in progress, listening to both sides of the conversation without either the caller or the agent knowing that someone is listening. There are two major drawbacks to silent monitoring.

One is that the monitoring must be conducted when a call is happening in real-time. Call volumes fluctuate, making it difficult to accomplish a certain number of observations per shift. In addition, catching a call at the beginning is tricky. Listening to a partial call and then waiting for the next one to begin can waste the observer's time. Another drawback is that there is no record of the call except in the observer's mind and notes. During the review with the agent, the agent may deny having said something, or may not understand what the observer means by an "unenthusiastic manner," for example. This lack of a record can be particularly problematic if a performance improvement plan or disciplinary action is being considered.

Call-Recording System

Remote monitoring and recording of the calls is typically accomplished through a call-recording system. While some organizations record every call for business purposes, most do not. The call-recording system is usually programmed to record randomly, sampling each agent at different times of day and week to ensure a fair sampling. Generally, the programming calls for a specific number of calls or minutes to be recorded per agent.

The system may also record the data screens and entries the agent performs during the calls so the review can include exactly what the agent saw on the screen and what keystrokes she entered as she processed the call. This information will be displayed on screen as the call is reviewed to help determine if the agent is navigating through the system in the most efficient way, making appropriate notes in the customer files, and accessing the right information to solve the customer's problem.

The call recordings generated by the system can be stored for future use or deleted immediately after review. The random selection process supports a fair and unbiased review, which can be important when disciplinary issues arise or accusations of bias are made against call center managers. If the system instructions are to gather the same number of calls or minutes for each person sometime during the shift, there can be little risk of the process unfairly targeting one individual or group of agents.

Most of these systems are able to selectively record a specific agent or calls to a particular group, but this is the exception rather than the rule in actual practice. Some centers choose to record all calls handled by trainees, for example, or those that come from a high-value customer group. However, in most centers, the calls are recorded randomly.

Another real benefit of having a call-recording system in place is the ability to review calls along with the employee.

Many call centers have a practice in which the supervisor and agent listen to a call together and score it independently. This allows the CSR to observe their own calls for self-evaluation purposes in addition to the feedback that the supervisor provides. With this tool, CSR cannot deny certain behaviors because the evidence is recorded.

An additional capability of call-recording systems is the ability of an agent to record a call in progress. This feature was originally intended to record abusive or threatening calls, but it is being used in many centers as a voluntary self-assessment tool. One call center uses this feature to have a "Worst Call of the Week" contest in which CSR can record a particularly difficult call to demonstrate how they used proper call-handling techniques to handle it.

Call-Monitoring Policy

Every call center that monitors calls should have a formal quality-monitoring policy in place. Much of the policy will outline the process by which employees will be notified of the call-monitoring guidelines, both during the hiring process as well as on an ongoing basis. The policy will also describe the tools and instruments to be used and how reviews/scores of calls will be communicated to the staff.

Quality-Monitoring Forms

Every call center needs its own version of a quality-monitoring form. Quality-monitoring forms should be relevant to the business, user-friendly, fair, objective, and, most importantly, useful as a coaching tool. The form should be carefully constructed, not just borrowed from another center, and updated as needed to reflect the changing needs of the business.

The form should be reviewed regularly by a team of representative frontline agents, supervisors, and quality assurance specialists. The team should, ideally, consist of eight to ten people with one person designated as the facilitator.

The review team should consider the call center's main performance objectives (which have been set to match corporate objectives). Note which goals are most important and which call center goals support those goals. The main purpose for monitoring calls should be to ensure that CSRs are attaining call center objectives on each call.

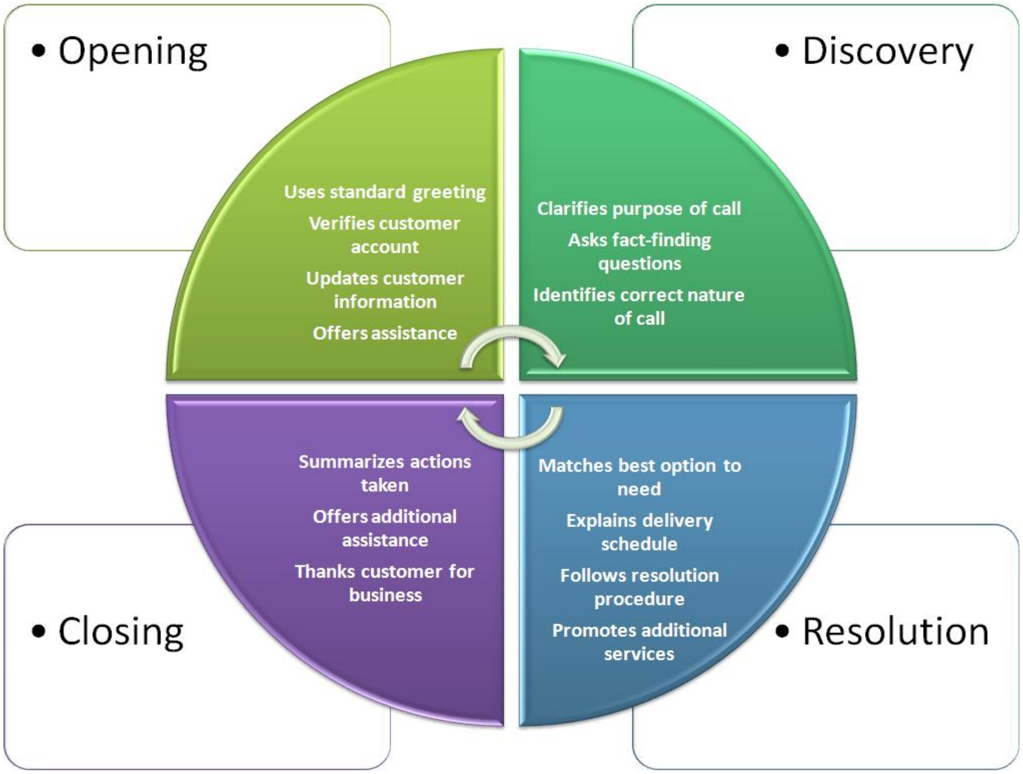
Sample corporate goals are:

Create unified customer experience.

Improve/maintain accuracy and efficiency.

When designing the overall form, organize the sections according to the order and flow of the call for easy use and speedy completion. Common sections that follow a logical order, along with associated behaviors, are listed in Figure A-1below:

Figure A-1 Example CSR Form


• Opening
Uses standard greeting
Verifies customer account
Updates customer information
Offers assistance
• Discovery
Clarifies purpose of call
Asks fact-finding questions
Identifies correct nature of call
• Resolution
Matches best option to need
Explains delivery schedule
Follows resolution procedure
Promotes additional services
• Closing
Summarizes actions taken
Offers additional assistance
Thanks customer for business

Quality-Standards Document

Every call center should have a quality-standards document that is a comprehensive reference for all the components of the quality-monitoring form. All the definitions of objectives should be included, along with samples of positive and negative behaviors to watch for in the call-monitoring process. This document should be updated regularly to add new examples and remove outdated ones.

Both supervisors and CSRs should be involved in updating this document. Review small pieces of it on a regular basis to remind CSR what the definitions of desirable and undesirable performance are, as well as to refresh and update the document.

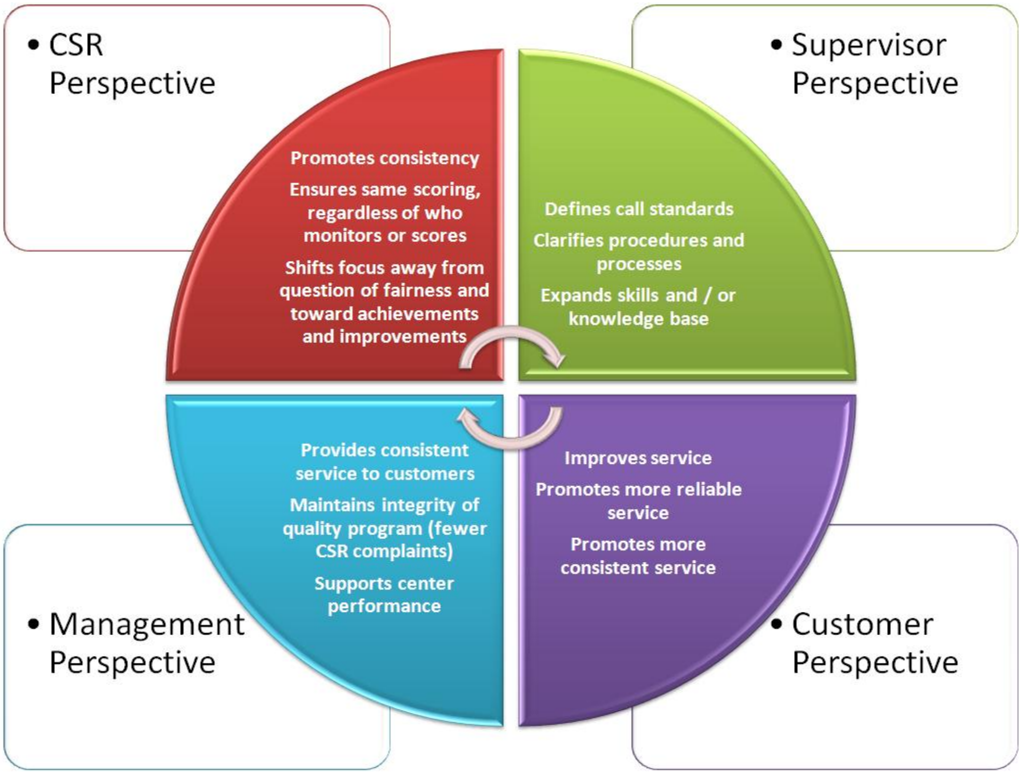
For each behavior, include the specific steps for performing the behavior. Include notes about when it should be performed during the call. Include what call center goal or corporate goal the behavior supports to demonstrate its relevance.

Call Calibration

An important step in the quality-monitoring process is the regular calibration of calls. Call calibration is the process of standardizing the call evaluation and scoring process. The ultimate goal of the process is to make sure that when any two people listen to and evaluate a call; they arrive at the same score. Calibration ensures fairness and objectivity in the evaluation and scoring process, and is an absolute requirement for improvement through the call-monitoring process.

There are benefits of call calibration for everyone in the call center, as shown in Figure A-2 below.

Figure A-2 Call Calibration Benefits


• CSR Perspective
• Supervisor Perspective
• Management Perspective
• Customer Perspective
Promotes consistency
Ensures same scoring, regardless of who monitors or scores
Shifts focus away from question of fairness and toward achievements and improvements
Defines call standards
Clarifies procedures and processes
Expands skills and / or knowledge base
Provides consistent service to customers
Maintains integrity of quality program (fewer CSR complaints)
Supports center performance
Improves service
Promotes more reliable service
Promotes more consistent service

These are the steps in the call-calibration process.

Gather a representative group. This group should include supervisors, agents, and quality assurance staff.

Depending upon the type of call being reviewed, it may be wise to include staff from other areas of the company.

The optimal size of the group is eight to ten people. If more than 12 people are going to participate, the group probably should form two teams.

Randomly select a sample of calls. Sample calls from various CSR at various times of day. Ask for volunteers to be monitored so that nobody feels like they're being "picked on" during the review process.

Listen and score the calls. Everyone should listen to the calls without comments or visual reactions, including laughing, rolling of eyes, etc., or anything that might influence another person's reaction to the call. The goal is an unbiased score from each person without anyone influencing others in the scoring process.

Treat each call independently. Even if the reviewer knows the person who took the sample call, the reviewer should try not to think about what the agent "usually does" on a call, or that the call may not be typical. Do not let that person's status in the call center or overall performance- influence the score for that particular call.

Start calibration with a definition of excellence. Discuss several calls without using the monitoring form, focusing on what was "excellent" about each call. Those items may be added to the definitions in the quality-standards document. If there were some problems with the calls, discuss what an expert agent might have done differently.

> Note any negative behaviors exhibited and add those to the "not-to-do" list in the quality-standards document.

Once definitions are set and everyone is clear on the attributes of an excellent call, score the calls using the monitoring form. Ensure that the definitions created in the discussion of excellence are represented on the form.

For each call, list each judge's score on the board without any rationale of how the scores were determined.

Ask the person who rated the call the lowest to explain his or her rationale. Determine what proficiencies need coaching and seek agreement from the group. The majority of the group should agree that the identified coaching opportunities are valid.

Have someone take notes regarding recommendations or changes in proficiency definitions.

Ensure that all the changes agreed to in the session are incorporated into the quality standards document and are added to the monitoring form.

Call-Scoring Evaluation

There are many different ways to evaluate and score various components of a call. Some call centers prefer the "Yes/No" or "Pass/Fail" checklist, where the form indicates whether the agent displayed the desired behavior. Assuming that the behaviors are adequately defined, this is a completely objective scoring process.

Yes/No scoring is illustrated in the scorecard below. This first example shows just the customer service skills from a more comprehensive quality-monitoring form that also includes sections for sales, technical, and specialized skills. In this scorecard, an agent's performance was observed over four calls. For some of the traits, the agent had the opportunity to demonstrate mastery of that skill or procedure on every call (such as prompt answer, positive corporate image, attentive listening, and using the customer name). On some calls, the agent did not have the opportunity to demonstrate a skill. For example, only two of the four calls required the caller to be put on hold during the call, and only one call provided the opportunity to demonstrate use of problem-solving steps and techniques.

Customer Service Skills	Opportunity	Compliance
Delivered prompt answer and salutation	● ● ● ●	● ●
Used agency name in greeting and closing	● ● ● ●	● ● ● ●

Used attentive listening skills and responses	● ● ● ●	● ● ●
Adapted call to customer tone and pace	● ● ● ●	● ●
Demonstrated proper hold technique	● ●	●
Used caller name during call	● ● ● ●	● ●
Used problem-solving steps to diagnose problem	●	●
Displayed empathy and support	● ●	● ●
Maintained control of conversation	● ● ● ●	● ● ● ●

As recorded on this scorecard, the agent had the opportunity to demonstrate proper behaviors 29 times, shown by the marks in the Opportunity column. The marks in the Compliance column show the number of times the agent displayed the proper behaviors or processes. In this example, the agent did the right thing 21 times. Therefore, the agent's score is 21 out of 29, or 72%.

In this scoring process, there is no judgment made about how well the agent displayed any of the skills. The agent is credited with a score as long as the behavior was displayed according to the definition of the proper behavior in the quality-standards document.

In addition to this type of Yes/No monitoring form, other forms can be developed that allow calls to be scored in a variety of categories, with a rating scale for each element (i.e., 5 for excellent, 4 for good, 3 for fair, 2 for poor, and 1 for unacceptable). This type of scoring has the advantage of showing a range of performance on each behavior or skill, so CSR can better see their strengths and weaknesses. However, it also adds some subjectivity to the scoring process unless each rating has a specific definition and example showing what would earn a 5 score versus 2 score for each skill. There is more work involved in this approach, but it communicates more specifics about CSR performance.

PERFORMANCE REPORTING

Once performance goals have been set and a system of measures developed, the final step in the performance measurement process is to develop a reporting mechanism. Reports inform management and employees about performance and help identify areas for improvement or corrective action. When developing a reporting strategy, providing information upon which decisions can be made or behaviors changed is critical. Table A-1 summarizes key elements in a reporting performance.

Table A-1 Key Elements for Reporting Performance

What CSR/Team Should See	What Management Should See
1. Telephone etiquette	1. Blockage
2. Knowledge and competency	2. Hours of operation
3. Error/rework rate	3. Abandons
4. Adherence to protocol	4. Self-service availability
5. First-call resolution rate	5. Service level
6.Transfer rate	6. Average speed of answer
7. Average handle time	7. Longest delay in queue
8. After-call work	8. First-call resolution rate
9. On-hold time	9. Transfer rate
10. Schedule adherence	10. Average handle time
11. Availability	11. After-call work
12. Conversion rate	12. On-hold time
	13. Agent occupancy
	14. Staff shrinkage
Primary Service Measures	15. Schedule efficiency
	16. Schedule adherence
Primary Quality Measures	17. Availability
	18. Conversion rate
Primary Efficiency Measures	19. Cost per call

An effective reporting strategy will provide a complete review of the current state of performance in the call center and should provide the means to identify gaps in performance, evaluate strengths and weaknesses, and suggest steps to improve call center operations. The reporting strategy should include what information will be presented, the frequency, the format, and the reporting medium. For example, CSR may need to see their performance statistics daily, and those could be provided via the company's intranet or in an e-mail. Other statistics, such as service level, may need to be communicated on a real-time basis to the center as a whole, so reader-boards might be used. Revenue reports might go to senior managers monthly and be delivered via a paper report.

Reporting Methodologies

The call center is, by its nature, a hub of communications. Customer calls, e-mails, Web chats, faxes, and correspondence are handled there. Even an internal support call center handles interactions with its internal customers in a variety of media. So it is natural that the call center will need to communicate with all of the utility's stakeholders. CSR need feedback to understand how well their performance is meeting expectations and what changes need to be made. Senior managers need to know how well the call center is using the utility's resources and how well customer needs are being met.

Developing a communications plan involves building a framework that defines the purpose of each report, the recipients, the sources of data, and the metric that is to be used. Different channels of communication must also be considered to ensure that the information arrives in an efficient and effective manner. Each group of recipients needs a specific level of detail on the measures that apply to them, with the detail or summary level that makes the data useful for decision-making. A variety of charts and graphs can be used for analysis of the data, and choosing the right format will help to make the data as relevant and useful as possible. Whether the goal is to inform CSRof their performance so that a continuous improvement plan can be realized, or to deliver updates to senior managers with summary trend analyses, having a clear plan for the reporting and communication effort will maximize the value of the data and minimize redundant or irrelevant reports circulating through the company.

To be effective, the reporting provided by the call center must be relevant, accurate, and timely. If the information is meant to result in a change, it needs to reach the appropriate people in time for that change to be accomplished. For example, if an agent is having a difficult time with a specific call, the supervisor must receive the information quickly in order to assist that agent in completing the call successfully. In the case of data provided on customer product needs or complaints, the information needs to reach the product development team while there is still time to modify the next release of the product.

Trend and summary data, such as reports on key performance indicators for senior management, are likely to be produced less frequently than the more detailed data that is shared among the call center management team on a daily basis. Call center managers are likely to react to information that indicates a problem quickly, while senior managers may be less likely to press for instant changes based on reports they receive.

The level of detail in the reports must also be appropriate for the audience. The agent needs to see details on his or her performance, perhaps even on a single call. But this level of information would be overwhelming for a call center manager who supervises 100 agents. At each ascending level of the hierarchy, the level of detail generally diminishes and is replaced by summary statistics and trend analysis. If these summaries spark interest in more information, the details can be provided.

Real-Time Reporting

The primary reason to have real-time data is to be able to make a change as quickly as possible. One such change that consumes a great deal of energy in nearly every call center is ensuring that the number of CSR available to handle the workload is matched to the actual workload as it arrives. The real-time displays provided by the ACD give supervisors and others in the call center information that can be refreshed as frequently as every few seconds. This data will inform the staff if there are calls in queue, how long they have waited, whether there are CSR available, and what work state each agent is in at that moment. If the delay is longer than the center’s goal, the supervisors can identify CSR who need to be encouraged to pick up calls, or even log in themselves to handle calls and reduce the wait time for customers.

Many call centers use wall-mounted displays or alert boxes on the agent's screen to provide access to these real-time statistics. This allows everyone in the center to see the status of the queues and other important information. This empowers CSR to take responsibility for logging in to handle calls when the queue backs up, and allows supervisors to keep an eye on the situation even when away from their desks and real-time monitoring terminals. These displays can also provide real-time information in a text message to handle the calls appropriately. For example, a cellular service provider may have a technical problem in one area and may expect calls from customers regarding dropped calls or other failures. By informing all CSR in the center via a text message on the wall display or on the text message area of the agents' desktops, these calls can be handled knowledgably and quickly.

Communicating Performance Results

Developing a performance communication plan requires a framework for the plan and a clear understanding of the purposes of the reports. The reporting strategy should align each of the report elements and measurements to the organization's goals and, ultimately, to its mission and vision statements. The organization's goals are communicated from the top of the organization with appropriate requirements for each business unit, department, team, and individual. Goals at the call center level, team level, and individual level should be clearly reflected in the key performance indicators of the call center. The analysis in performance reports typically starts at the smallest unit and rolls up to the top of the organization. Individual performance reports roll up into team goals. Team results roll up into department results for the call center, which combine with other departments to make up business unit results, such as those for the customer care unit or a regional unit of a multisite operation. Ultimately, the business unit goals and results roll up to the total organization.

Therefore, the call center's measurements and reports must align with the goals as they roll up through the organization.

Reporting Framework

Reporting and communication should not "just happen" but should follow a plan that addresses what needs to be communicated, to whom, when, and at what level of detail. Each goal that the call center can contribute to should have some reporting elements that identify how well that goal is being met. Developing a reporting framework is a useful process that organizes the effort and identifies each of the elements that must be addressed in the reports. In the example below, a model for a reporting framework is provided to serve as a basic outline to develop the reporting and communications plan.

Report Title	Purpose	Info Reported	Source	Recipients	Distribution Frequency	Channel Used	Report Owner

Each of the columns is intended to assist the call center manager in developing the plan for the reports and communication processes that need to be accomplished. The explanation of the columns below includes an example using a speed-of-answer goal as an element of ensuring accessibility to customers.

Report Title. This is the name that will be given to the report so that it can be easily identified. There may be a series of reports that are grouped together to convey various elements of the same performance metric. An example might be "Weekly Speed-of-Answer Report," which could be part of a series of reports that include daily, weekly, monthly trend analysis, and even half-hourly reports that are needed at different levels of the organization.

Purpose. The reason that the report is provided is the purpose, and this ties back to the organizational goals. For example, the speed-of-answer reports are provided to measure the call center's performance against the goal of providing accessibility for customers or being "easy to reach." Other accessibility reports might include analysis of call attempts turned away after hours, busy signals, and Web site availability percentages.

Info Reported. This column is used to provide the specific data fields that will be included in the report, the calculation if appropriate, and the goals that are being measured. In the case of the speed-of-answer goal, the report might indicate that 70% of calls are being handled within 20 seconds in 75% of the half-hours of the day. The report might illustrate how the data is calculated.

Source. This column provides the source of the data that will support the calculations and data elements. The source will identify the system reports or other places where the raw data that support the calculations in the report are found, such as the ACD Daily Service Level Report. Some reports will require multiple data sources.

Recipients. This column identifies who will receive the report and may include titles and/or specific names. Using names and titles makes the plan document easier to use but requires more upkeep to keep the plan current as personnel change roles in the company. The speed-of-answer report will be broken down into several levels of data, and each will be provided to a different group of recipients. For example, the call center supervisors will need the half-hourly report while the senior managers may prefer the monthly trend analysis.

Distribution Frequency. This column defines how often the report will be generated and distributed to the defined recipients. In some cases, intermediate data will be needed to roll up into the specific report, and that should be clearly defined with a timeframe for when the components are due in the hands of the final report developer to ensure that the composite report is completed on time.

Channel Used. This column defines the way the reports will be distributed. Some may be made available on a company intranet for the recipients to access as desired. Others will be printed and presented, or provided via an e-mail attachment. The speed-of-answer reports that are distributed within the call center are likely to be posted on the wall for all to see, while the monthly reports are more likely to be e-mailed or printed and distributed since some personnel are not in the call center every day.

Report Owner. This column defines who in the organization has responsibility for development and distribution of each report. The speed-of-answer report is likely to be the responsibility of the workforce management team within the call center, but a specific individual should be identified for each report to avoid confusion and missed reports. Once again, job titles and names are helpful so that when a person changes roles, tasks can be identified and assigned.

It is common in existing call centers to find reports that are not used by some or all of the recipients. A report may have been developed to meet a demand from a former manager or to track a situation that was resolved months ago.

Therefore, it is a good practice to review the reporting and communication plan at least annually and determine if each report is still relevant and useful to all of the recipients. Cutting down the distribution list may be appropriate if a report cannot be eliminated. Perhaps the data provided is not at the right level of detail for the current environment. A new report may be needed because of a new technology or a change in process or products/services provided. The annual review will help to ensure that the reports serve a defined purpose and are worth the time needed to produce them.

Communications Channels

Part of the communications plan includes determining the best channel to use for the report or communication. Some information is best delivered in writing, and other communications are better provided orally and in person. There are many options to consider:

Face-to-face. A human-to-human interaction done face-to-face is typically vocal but may be accompanied by a paper document to reinforce and memorialize the vocal statements. Most vocal communication on individual performance should be documented on paper.

Paper-based. This includes any printed or hand-written report including a pre-printed form, graphics, tabular numbers, printouts from systems, and/or text. This is the best medium to use when communicating a large amount of detail, a complex concept, an ongoing analysis that will be amended on a regular basis, or any analysis that requires charts and graphs to be effective.

Telephone. A telephone call may be used to inform another party of a performance result. The telephone communication may be accompanied by a paper document or an e-mail.

E-mail. E-mail is becoming more common and is often used inappropriately when face-to-face communication is required. However, e-mail is a good choice for routine updates and unemotional information. It is best for small amounts of detail at one time rather than large documents.

Internet or Intranet. The Web must also be considered an electronic communications channel that can be an effective or destructive mechanism for disseminating both information and misinformation. In multisite call centers, an intranet site is often used as a central repository for performance data and information that needs to be accessed by personnel at all sites.

Real-Time Display. Another electronic form of communication in the call center is the real-time display that may be on a wall-mounted light board, a TV screen, or displayed at the agents' desktops on the phone or computer. This channel is typically used for information that is only seconds old and is continually updated.

Formal Presentation. Delivery of a formal presentation is generally a combination of a face-to-face communication with written supporting documentation. Graphics, slides, or other charts may also accompany it.

Grapevine. The ever-present grapevine of rumors generally passes information from one person to another without a formal plan. While it is possible to use the grapevine as an effective communication channel, it is generally avoided because of the lack of control over the quality of the information and the people who will receive it.

Communications to CSRs

Communication with CSR involves not only the information regarding job performance metrics and achievement of goals, but daily operational data and the constant barrage of changes that must be assimilated each day. Ensuring that CSR on all shifts, along with those who may be absent on any given day, receive the important data is a challenge that requires a thoughtful plan and consistent execution.

Operational Communications

One of the most frequent and important communications with CSR is the schedule. Each agent wants to receive assignments as early as possible to allow for childcare, appointment, and transportation arrangements. The center may require changes to the schedule because of varying call loads and staff availability, and CSR may trade schedules.

Keeping the CSR and the center informed of all these changes is a challenge. Setting up a process to manage schedule-exception reporting is a key task since there can be hundreds of schedule exceptions a day in a large center.

Another constant flow of information is the change data that CSR need to know. This information may be distributed on paper, via e-mail, or even by voice message. The most effective method depends in part on how long the information is valid and whether it is simple to remember and apply. A temporary system failure may be communicated to the CSR via a wall-mounted display since it is usually a simple message of limited duration.

Performance Communications

There are many performance measures that apply to the call center as a whole, some that apply to teams, and some that apply specifically to the agents. The measurements that apply to an individual agent include quantitative measures as well as some qualitative measures.

There are some measures over which the agent has little or no control. It is essential to consider that aspect of each measurement so that CSR know whether a measure is within their control and how they can affect it. Sharing other measures with the team to ensure broad focus on the bigger issues is useful even though it is not reasonable to hold CSR responsible for them. For example, one metric that CSR have little control over is the service level. If the CSRare adhering to their schedules and available when they are supposed to be, they cannot be responsible for an unusual call volume or an inaccurate workload forecast. The CSR need to know how well the center is performing against that goal since it is important to the center overall, but it should not be a metric on the agent's performance expectations.

Communications to Teams

Communications to teams and supervisors generally include summary results for the agent group that is included in the team. The supervisor needs to see the individual results for each member of the group and the group averages to make comparisons. In addition, a report that shows the team's position relative to the overall center goals and to other teams may be useful, especially when some competitive spirit will encourage improved performance.

In general, group summary reports are less likely to create an emotional response than the reports that communicate individual agent performance. Since the individual performance of each person is hidden in the totals for the team, no one is singled out as a great or poor performer. These reports are commonly communicated electronically, posted on an intranet, or printed and posted on the wall of the center. Some centers post the reports with the agents' names and individual data; others use a code so that each agent can find his or her own data and compare it with others', but everyone's privacy is protected.

It is also appropriate to share center-wide information with the supervisors and teams to indicate how well the center is doing in achieving its overall goals. This information might include ASA, abandon percentage, cost/revenue per call, and customer satisfaction survey results. While individual CSR should not be held responsible for these goals, each person plays a role in meeting them. Keeping everyone informed about how well the center is meeting its overall goals helps to build the spirit of teamwork that is essential to the call center's success. To the extent that an entire call type or work type is controlled within a single team, it is especially appropriate to provide the summary data on that work to the supervisor for that team.

Communications to Management

As the reporting and communication process moves to the overall call center level, the data that was provided in detail for teams and individuals is summarized one more time. The data may be sorted in a number of ways, including by call or contact type, by shift, by day, by supervisor, and so on. The manager will see the reports sorted with an overall summary for each team or data type and the totals/averages for the entire center. In multisite operations, the director may see each center separately and a system-wide view. At this point, trend analyses with charts are generally useful to give a graphical overview of the data in a quick-to-read format. Trends over a 12-month period are common, but daily data may be needed to ensure that the details are not buried in the averages. If a change has taken place that will affect the statistics (such as implementation of a new technology), the change should be noted on the reports to ensure that its impact can be correlated with the trends.

Reporting accessibility goals, such as call blockage and self-service option availability/usage, is appropriate at the center level. In addition, speed-of-answer goals, such as service level or ASA, delay percentage, and longest delay before answer or abandon, are appropriate reports on a center-wide basis.

Overall speed of answer, delay experiences, and abandon percentages are typically reported at the center level for each call or work type separately. As more centers take on electronic work, such as e-mails, response time on these transactions will be tracked in much the same manner as the call service levels are today.

The center tracks its overall compliance with the operating budget on a monthly basis at a minimum, and capital budgets are tracked to ensure that the projected return-on-investment results are actually achieved. Many centers track their staff in terms of full-time equivalents because staff is the single biggest cost component for a center. This involves calculating a forecast of workload for several months and analyzing the utilization of full-time, part-time, contract, and outsourced personnel, along with potential overtime. The number of staff on vacation and the overall shrinkage estimates are included in the analysis along with forecasts of training classes and the workload that they may be able to handle.

Self-service utilization is generally tracked at the call center level to determine the trend of IVR and Web usage because these technologies are designed to do some of the agents' work. Correlating the shift in work volumes as these self-service tools are used allows managers to see the impact they have on the average handling time of the calls that CSR handle.

Call Center Benchmarking and Key Performance Indicators

In the following discussion, an overview of key measurements and associated benchmarks are provided as guidelines to the development of key performance indicators ("KPIs"). Table A-2 describes typical key call center benchmarks and targets, while Table A-3 provides a list of example team / individual goals.

Table A-2 Key Call Center Benchmarks

Metric	Key	Benchmarks
Total Calls:	An internal metric for all calls presented to the center including handled by IVR, abandoned, and calls offered to the call center.	*No benchmark, client based and industry specific.*
Calls Offered:	Total number of calls sent by the phone company to the call center. This count is normally presented as a total and then broken down by line and generally comes from the phone company in regular reports.	*Depending on industry and service offering, you would look for your IVR to provide service to 10%-30% of your callers.*
Blocked:	The number of calls that were offered but not accepted by the call center phone system, or a specific line, due to technical or capacity issues. This number usually comes from	*The goal is always ZERO. There is no industry standard, but most call*

Metric	Key	Benchmarks
	the phone company in regular reports and should be reported daily, tracked weekly and monthly. The number of individuals in the call center can have an impact on incoming trunk blockage. If the center is understaffed because the schedule is not being followed, delays in queue will increase, driving up the workload on the Incoming trunks and perhaps causing a higher incidence of blockage. However, blockage is typically not a measure of individual performance. Trunk blockage may be measured by looking at an all-trunks-busy report from the ACD, which shows intervals where all incoming lines were in use and callers received busy signals. Blockage can also be reviewed by requesting a blockage study from the local or long-distance carrier, which shows by interval how many calls are attempted to reach a number but received a busy signal. Having the proper number of incoming telephone lines into a call center to ensure a reasonable level of blocked calls is a traffic engineering process that involves calculating telephone trunk workload and using a random traffic arrival pattern algorithm (called an Erlang technique) to determine the optimal number of incoming lines .	*centers today set a goal of <2%.*
Answered:	At the call center level this number will represent the total number of calls accepted into the call center phone system.	*The goal is to answer all calls offered.*
Abandoned in IVR:	A call that terminates prior to having had the opportunity to complete routing to or listening to a complete FAQ recording.	*The goal is to have zero calls abandoned in the IVR system.*
Average Answer Delay:	The average length of time (in seconds) a caller must spend waiting before the ACD can find an available agent to take the call. This number is not the equivalent of Average Speed of Answer as it includes only those calls that actually experience a wait. Also known as average time of delay.	*An average queue time of less than 20 seconds is considered exceptional.*
Average Speed of Answer (ASA):	Equal to the total time in queue divided by the total number of calls answered. This data is available from the ACD. This number is generated by the call center phone system. ASA is a measure for the call center, not individuals. However, ASA is directly affected by staffers being available to take calls when scheduled, so schedule adherence is the measure of individual performance that is typically in place to ensure that the call center's ASA goal is met. Most call centers measure service level and/or ASA as the	*There is no industry standard for ASA or for the number of periods in a day that ASA goals should be met. 20 seconds or less is a common ASA goal for world-class operations.* The recommended metric for service level and ASA is the percentage of the

Metric	Key	Benchmarks
	average number accumulated at the end of each day. While this is the most common way to assess these two speed-of-answer measures, this end-of-day average is not necessarily the best way to assess and report these measures. Calls arrive at a Call Center in peaks and valleys. Periods of the day have many calls; at other times, the volume drops substantially. A center might have an ASA goal of 30 seconds. Given the volatile arrival patterns, there will likely be periods of the day in which the center is understaffed to handle the calls and its ASA might be as long as 5 minutes. Conversely, in the no peak hours, most calls will be answered immediately. At the end of the day, the average for each of these periods may yield a 30-second ASA result. However, that number does not reflect the service situation encountered by all people who called the Call Center.	intervals (hourly or half-hourly) for the day in which the service level or ASA goal is met. This metric provides a much more useful look at speed of answer with more information to address staffing issues and adjust schedules for better work coverage. The key is to measure the interval success rate and use that to determine how to adjust schedules to increase the percentage of intervals in which ASA or service levels goals are met. **Note:** The Department does not have an ASA goal developed as yet.
Abandoned:	The number of calls that are terminated by the caller while waiting for a live agent.	*A typical goal is <2%.*
Abandon Time:	An internal metric for the average time (seconds) a caller waited before abandoning a call. When looking at this metric be sure to factor out the high and the low times. Sometimes a call will get stuck in queue and not be hung up thereby altering the average time.	*This statistic depends on the individual call center. An acceptable time is under 120 seconds.*
Calls per Hour:	The average number of calls that an agent handles per hour is equal to the total calls handled during a work shift divided by the total time logged into the telephone system. This number is generated by the call center phone system. This measurement is used to compare the productivity of one agent to another. By looking at calls answered per hour instead of total calls answered you factor out the number of hours worked/paid.	*This statistic depends on the length of call.*
Cost per Call	A key performance indicator for most call center operations. Regardless of whether it is tracked as only a labor cost or as a fully loaded cost, the cost-per-call figure is used to evaluate how efficiently the company’s financial resources are being used and what its return on investment is. The cost-per-call rate can track just labor costs per call or it	*Varies by call center and industry.*

Metric	Key	Benchmarks
	can include all the telecommunications, facilities, and other service costs in addition to labor costs. When determining the cost per call, the components being used must be defined and used consistently in evaluating how the call center is using financial resources over time. Although cost per- call rates are commonly used to compare one company or site with another, this practice is not recommended because the components included and the types of contacts may vary.	
Occupancy Rate:	The % of time in a given hour that an agent or a center is actually on the phone processing phone calls. Occupancy allows an analysis of both t he volume of calls and the efficiency in processing those calls. Agent occupancy, or staff occupancy, is one of the most important numbers to measure related to efficient use of personnel. If occupancy is too low, CSRs are idle. If occupancy is too high, CSRs are overworked. The size of the call center has a major impact on call center staffing and the related staff occupancy. Centers handling larger volumes of calls will naturally be more efficient than smaller ones because of economies of scale. Doubling the call volume does not require two times the number of staff to meet the same service goal of 80% in 20 seconds. As the volume grows, the staff-to-workload ratio gets smaller and the agent occupancy goes higher. With a higher volume of calls, there is a greater likelihood that when an agent is finished with a call, there is another call for that agent to handle, resulting in increased efficiency and higher occupancy. With a bigger volume of calls, each agent has the opportunity to process more calls each hour. Each agent spends less time in an idle or available state, waiting for a call.	*Typically 75% or 45 minutes of the hour.*
% Service level:	% of calls answered in less that X seconds. (Offered calls *100). Service level is generally measured by half-hour and can be reported as a cumulative simple average over the day, a weighted average over the day based on the actual calls per half-hour, or can be gauged by the percentage of half-hours of the day in which the half-hour service goal is met. Various forms of service level reports are available from the ACD. *Service level is a measure for the call center and not individual agents.* However, service level is directly affected by staffers being available when scheduled, so schedule adherence is the	There are no industry averages, though an often cited goals is 80/20 where the objective is to answer 80% of the calls within 20 seconds (used in the health care industry).

Metric	Key	Benchmarks
	measure of individual performance that is typically in place to ensure that the call center's speed-of-service goal is met.	

Table A-3 Example Team / Individual Goals

Metric	Key	Benchmarks
Adherence To Schedule:	A measure of whether agents are "in their seats" as scheduled. Adherence is calculated as a percentage equal to the actual time an agent is logged into the system ready to answer the telephone divided by the total time the agent is scheduled to be ready to answer the telephone times 100. The data for the percent adherence is taken from the ACD and should be reported daily, tracked weekly and monthly. Schedule adherence is an important measure of team and individual performance in the call center because it affects so many other measures. Each agent should be evaluated on total hours worked versus scheduled, as well as adherence to the defined work schedule of start and stop times, scheduled breaks, and other activities. This is an important individual performance metric because CSRcan largely control their adherence to the schedule.	*Typically the goal is 80% or better, though there is no industry standard.* *Adherence goals are generally established by determining a reasonable "safety net" of minutes for the day when the agent can be out of adherence and then translating that number into a percentage goal. For example, if CSR get 30 minutes of "free" time per day, and they are paid for 420 minutes on the phone for the day, the adherence goal would be 94%.*
Adherence to Protocol	Adherence to protocols, such as workflow processes or call scripts, is another essential element of quality in the call center. Ensuring callers receive a consistent call-handling experience regardless of the contact channel or the individual agent involved in the contact is particularly important to the perceived quality of the contact. Adherence to protocols and procedures is a crucial element of individual agent performance in the call center. Adherence to telephone procedures and call scripts is typically monitored through both general observation and a more formal quality-monitoring process.	*Not measured quantitatively.*
After Call Work Time:	This is the time after a call is completed that the agent needs to complete administrative work related to the call. The data for after call work time is taken from the ACD and should be calculated by individual and group	*This could range from 90 seconds to 5 minutes depending on call center specifics.*

Metric	Key	Benchmarks
	daily, weekly and monthly. ACW should be measured and evaluated over time to determine the appropriate amount of time needed to accomplish the necessary tasks. This overall call center ACW number will then typically serve as the benchmark against which to measure an individual agent's ACW time. Comparisons between CSRs should be made with similar types of calls because the requirements of different call-handling situations can vary significantly. ACW should be measured by type of call as well as by individual. Measuring ACW by time of day is also useful. When understaffing results in high occupancy for staff and very little idle time between calls, ACW time is typically higher because CSRs stay in the non-call state to catch their breath between calls. Observing this type of metric will indicate those CSRs in need of coaching to prevent their unavailability during already understaffed times.	
Average Handle Time:	An internal metric that is the sum of talk time and after call work time. AHT is used when determining overall workload and staffing requirements. AHT reports are available from the ACD. To accommodate differences in calling patterns, AHT should be measured and identified by time of day as well as by day of week. It measures overall call center performance and team and individual agent performance. Although handle times will vary based on call content, an agent should typically deliver a consistent handle time within an acceptable range. However, overemphasizing short AHT can reduce the quality of the interaction and decrease the conversion rate.	*There is no industry standard or recommendation for AHT. AHT numbers should be gathered and analyzed primarily to determine if CSRs are in an acceptable range of performance and whether differences among CSRs are associated with different conversion rates.*
Hold:	This is the number of seconds that an agent keeps callers on hold. Measures of on-hold time are available as ACD reports. Most call centers measure on-hold time, but it is not necessarily one of the top performance indicators. An overall high percentage of on-hold time may indicate that system performance is slow or that access to multiple systems is delaying the CSR in processing callers' requests. On-hold time is more typically used as a gauge for individual CSRs and can indicate insufficient knowledge or	*There is no industry standard for this metric, though ideally Zero is the target. The goal is to minimize the number of increased call efficiency and service to the caller.*

Metric	Key	Benchmarks
	other performance gaps. Call centers will want to review the percentage of calls an agent has to put on hold as well as the length of the hold time.	
Occupancy Rate:	Occupancy rate is equal to (Talk time + hold time)/ (Talk time + Hold time + Idle time) times 100. The data to make this calculation is available from the ACD.	*In an operation with a 75% utilization target that is tightly managing idle time it is possible to achieve 80% or greater Utilization numbers.*
Schedule Efficiency	Schedule efficiency measures the degree of overstaffing and understaffing that exists as a result of scheduling design. Also referred to as the net staffing measure, it indicates how many staffers the center is "over" or "under" for each hour or half-hour of the day. Schedule efficiency is generally viewed as one of the most important measures of productivity or efficiency in a call center. This critical measure indicates whether the most expensive resource in the center—the frontline staff—is being used in the best way possible to match workforce to arriving workload. The measure itself can be a manual one, comparing actual scheduled staff to required staff based on actual workload by interval. If the Call Center service provider has an automated workforce management system, the schedule efficiency report will be generated by the system. Schedule efficiency is best measured by looking at how many intervals of the day the net staffing is within a reasonable range. While the ideal is a net staffing of zero (no understaffing or overstaffing), that number is nearly impossible to hit.	*No industry standard; however, most call centers set an acceptable range of over/under and then measure how many intervals meet the goal. Some centers set a net staffing goal that is very small (e.g., +/- 1 or 2 staff), while larger centers may have a higher net goal (+/- 5 staff).* *The key is to measure the number of intervals or percentage of intervals that meet the goal. Much like when measuring service level or ASA, it is dangerous to simply do an overall number for the day, where the over-staff and the under-staff cancel each other out. For example, an overstaffing of five people in one hour does not balance out an understaffing of five people in another hour. Rather than the "net zero" for those two hours that would be obtained by averaging, the important finding is that neither interval met the schedule*

Metric	Key	Benchmarks
		efficiency goal.
Utilization:	Agent total talk time divided by available time.	*Utilization target is generally 75% or higher.*
Available Time:	The amount of time that the agent was logged into the phone system and available to take calls. Availability is another important gauge of team and individual performance and can be measured as hours of time available or percentage of time available. The call center may measure total hours of availability and availability by team or by individual agent. If the CSRs are adhering to the schedule they are given and available time is low, the problem can only be solved at the team and call center level by changing the scheduled activities.	
Logged In Time:	The total amount of time that an agent was logged into the phone system regardless of status.	
Not Ready Time:	The amount of time that an agent was logged into the phone system but not available to take calls.	
Average Talk Time:	Average length, in seconds, that the agent spends on a call.	*Initial target is <180 seconds for agent calls.*
Calls Escalated:	Number of calls passed from an agent to other staff for resolution. This number is generated by the call center phone system.	*Patterns will emerge over time allowing for a reasonable range to be set for this number.*